



COMPUTER WEEKLY

US computer fraud Bill 'technically unsound'

'Police chief sold criminal data' claim

A POLICE chief in Wheaton, Illinois, has been accused of selling criminal records from the State's police computer to a private transport company for use in screening job applicants. In a series of articles, the Wheaton Daily Journal alleged that Donald Buccamanto had taken criminal histories from LEADS, the Law Enforcement Agencies Data System, and sold them to Risa International of Kansas City, Missouri. The case at present is being considered by a grand jury.

A BILL intended to fight a wide range of computer crime, at present before the US Congress, has been criticised as badly drafted and technically unsound by experts testifying to a Senate Committee.

The Federal Computer Systems Protection Bill is intended as an omnibus computer crime law that would clamp down on the increasing number of computer frauds in the US. It is sponsored by Senator Abraham Ribicoff (Democrat, Connecticut) and endorsed by the US Justice Department and the FBI. The law would broadly cover "any unauthorised act" carried out on any computer, government or privately owned, that is

used in interstate commerce, and would impose prison sentences of up to 15 years.

The Senate Judiciary subcommittee considering the Bill was told by Donn Parker of SRI, formerly Stanford Research Institute, that if the Bill were enacted in its present form a large minority of computer staff would be made criminals. It

makes a great many innocuous acts into felonies, while failing to cover other real crimes.

Parker pointed out that the definitions in the Bill were bad, in that, for instance, it could be taken cover even program-mable calculators and digital watches. Most programmers, Parker pointed out, use spare computer time for trivial ex-

traneous activities such as playing games, printing Snoopy calendars, or maintaining church mailing lists. It is important, he said, that these people not be lumped in with the real computer criminals.

Parker asked the Committee for more time, to allow the Bill to be considered by the computer community at large.

Sacked gas staff appeal to tribunal

TWO computer staff at Northern Gas in Newcastle-on-Tyne have been dismissed from their jobs for using computer time for private purposes, specifically for printing blotter charts.

The men are David Finan, an operations shift controller, and Stephen Foster, a programmer. Finan is taking Northern Gas to the Industrial Tribunal for alleged unfair dismissal.

The reason for dismissal was given by Northern Gas as "gross misconduct" which was "directed towards personal financial gain." Finan and Foster had placed an advertisement in a newspaper offering personal blotter charts for sale.

Finan, however, claims that they never sold anything — that the advertisement was exploratory.

Finan also claims that someone in the Northern Gas management knew what they were doing and even asked for his own blotter chart; so they assumed there was no objection to what they were doing. The case will be heard in Newcastle on July 27.

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'Criminals gain too much knowledge'

CAREER criminals are becoming increasingly knowledgeable about computers, the Senate Judiciary Committee was told by consultant Donn Parker, and it is important that legislation be introduced to deal directly with computer crime. At present, Parker said, many fraud cases have to be punished indirectly, as in the case of two programmers who stole \$14,000 worth of computer time but could only be convicted of mail fraud.

Parker said many companies that discover they are victims of computer fraud do not report the fact, because of fear of publicity, and prefer to write off their losses as book-keeping errors.

Parker added that he hoped the legislation would not be too rapidly to the licensing of computer systems or staff. "The technology is changing too rapidly to have enough standards or generally accepted good practice against which to certify or qualify for licensing," he said.

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Briefing 'Triple hospital budget' call

A REPORT to the West Midlands Regional Health Authority has called for its budget for information services to be tripled — an increase of £1 million a year. Most of this would go towards providing minicomputers for hospitals to reduce their reliance on central systems which, the report says, are overloaded.

The Regional Users Group, which produced the report, was set up to find ways of making medical information more readily available to hospitals and doctors. It found that the Health Authority spends 0.5% of its budget on information services, which the group feels is not nearly enough.

GEC ops go back

THE 16 operators sacked by GEC over industrial relations disputes (CW, July 9) will go back to work at the Stoke, Coventry, plant on Monday. They have accepted the company's offer to take the matter to ACAS for independent arbitration.

35-hour week call

SUPPORT for the Post Office Engineering Union's pursuit of a 35-hour week has come from the Civil and Public Servants Association whose Post and Telecoms group secretary, Jeannie Drake, says "We're helping to make their industrial action as effective as possible." Meetings have been taking place between the PORU, the Post Office and Lord McCarthy, who was invited by the DoI to make recommendations to the two parties. A further meeting takes place today (Thursday).

Rejected

OPERATORS and programmers at Brighton council belonging to NALGO have had a request for regrading turned down by the council. Their case has now been taken up by NALGO and will be heard by the grading appeals committee of NALGO's South East England Provincial Council.

IBM setback

HIGHER costs, including expenditure on increased capacity to meet growing demand for its products, reduced IBM's profitability in the second quarter. Profits were a modest five per cent ahead of \$801.2 million despite a strong 11% advance in turnover to \$4,920 million. Sales of all equipment were up 14% at \$1,900 million, while rental and service business advanced seven per cent to £3,000 million.

Doctors' 'No'

DOCTORS at the BMA annual meeting at Cardiff passed overwhelmingly a motion that no doctor should be party to recording information about patients on a computer system that cannot safeguard confidentiality. Strong criticism was voiced of the Child Health computer system proposed by the DHSS (CW, May 4).

COMPUTER WEEKLY

Number 610

Thursday, July 20, 1978

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by PO policy'

complete in overseas markets, he said, resulting already in thousands of lost jobs. The claimant said that lack of accountability accounted for the PO's failure to develop progressive policy. He recommended that its monopoly be transferred to a private agency which would be subject to the same competition as other agencies. He said that Europe should be able to compete with the UK, such as the PO, should be commissioned.

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MPs to debate port delays

CONTINUING discontent among shipping agents over delays caused by the computerisation of import procedures at seaports, is to be the subject of the adjournment debate in the Commons tomorrow, July 21.

The debate will be led by Julian Ridsdale and Peter Ross, who are Tory MPs for Herwich and Dover respectively, two of the eight ports where HM Customs is implementing the controversial systems.

Agents at Herwich began to express discontent about three months ago when implementation of the system there started, and earlier this month Ridsdale wrote to the Chancellor of the Exchequer, Denis Healey, asking for an immediate inquiry into the working of the new procedures and what steps he was taking to improve import clearance times. In a written reply, the Chancellor said he would

not order an inquiry but was "looking into" ways of improving clearance times. No clear answers were given to two other questions about what actual clearance times are at the moment, and about what part of the cost of introducing the systems will be borne by shipping and forwarding agents.

The system being implemented at the eight seaports will hold databases of duty calculation rates and prohibited goods and will enable imports to be cleared online by HM Customs officials equipped with terminals.

The delays creating the problems have been caused mainly by changes in paperwork and procedures rather than faults with the computer equipment. The whole project was first described in detail in Computer Weekly more than two years ago (CW, March 11, 1976).

Real time net from CEEB

IN an effort to improve software standardisation on all its real time processing applications, and to provide a programming language for use by non-computer specialists, the Central Electricity Generating Board is developing a new software system, called Compass, which will be made available to outside suppliers (writes Peter Hewitt).

Intended as the future standard for all real time online computing throughout the CEEB, Compass is aimed particularly at ensuring machine independence and is specifically intended for distributed processing networks.

Although licensing details have yet to be finalised, Compass will be made available to outside equipment manufacturers who will be able to supply complete applications systems to the CEEB, although control and maintenance of the system software will be handled entirely by the board.

The initial development of Compass will cater specifically for plant monitoring, modulating control, and data logging systems. A pilot scheme in the area of modulating control is expected to be in operation by the middle of next year. The second phase of the development will extend Compass to include sequence control, alarm handling, visual display, and history recording. General release of the software is planned for the end of 1979.

A CEEB spokesman pointed out that although the timescale of the development is ambitious, many of the system components already exist. For example, the CEEB has already developed two products based on high level interpretive languages for direct use by engineers, Ddacs and Sweepspeed.

The new language would be based on this existing work, he said. There would be a two stage translation process, the first step

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● Turn to Page 18

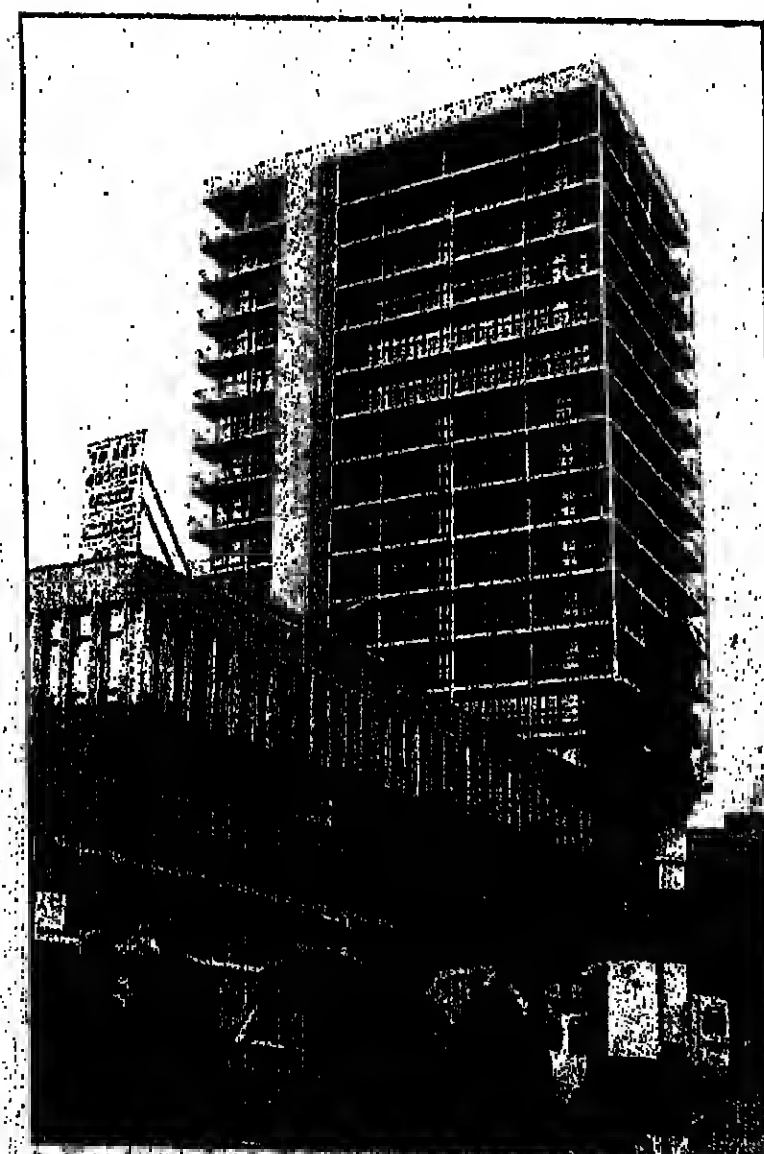
Wirth hits at Ironman

INSTEAD of developing a new language to form its standard real time applications, the US Department of Defence would have been wiser to opt for an existing language that had been in existence a few years.

That is the view of Professor Niklaus Wirth, who is best known as the designer of Pascal, which was the basis of all four languages developed to meet the DoD's "Ironman" requirements. Professor Wirth was speaking at York University.

● Full report, page 7.

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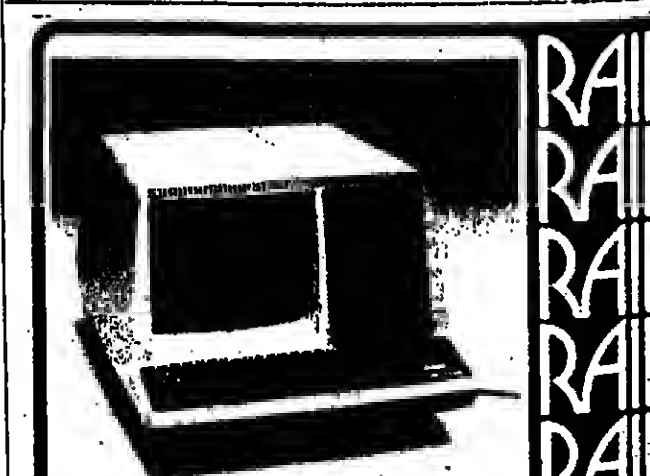
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COMPUTER WEEKLY'S INSIDE NEWS

Puzzler	6
Software File	6/7
CDC success with the Cyber 8	8
Level 8 additions	8
Computers report	10
People in the News	10
Diary Dates	10/11
Computer Supplies	11/12
Letter to the Editor	14
Op Spot	15
Series 1 market in the 90s	18
Micro News	19
Sales Bit	45
Hot 100	47
US may block sale to Soviets	48

APPOINTMENTS: PAGES 20-48

It's all right world, we're only programming

IT is very easy for computer professionals to become so wrapped up in the delights of their technology that they forget about the ends, for which computers are only the means.

Yet computers can be as lethal as a gun or as beneficial as a brain surgeon and the computer professional who designs the system should not be absolved from some responsibility for its effect.

This concern should extend to informing and alerting "the outside world" to the effect of the technology.

The question of responsibility is most graphically illustrated by major systems which enter the political arena. The US government, for example, has stated that it regards some computers in the same category as military weapons, and has banned the sale of certain systems in certain regions like South Africa and some South American countries, where it is believed they may be used in infringing human rights.

And the sale of US computers

to Russia is becoming a key factor in East/West bargaining (see page 48).

The potential impact of the micro has also been discussed at seminars in the mass media of late so that nobody can be in any doubt that great changes in human lifestyles could soon be created by our technology.

There are some who argue that it is not concern of the computer professional to worry about the potential widespread effect of their systems. The argument goes, it is up to others to decide how they are used, while computer professionals are there only to get things done.

This parochial view is not uncommon and its effects can be seen in daily bread and butter DP applications as well as in the matters of life, death and human rights.

DP history of the last 15 years is one of great technical advancement but often poor application of the technology. Poorly designed and implemented systems have been the norm rather

than the exception.

Yet this would have been less likely to happen if DP professionals, particularly programmers and analysts, had been made to face up directly to their responsibilities to their users.

DP people tend to feel more of a loyalty to their technology than to their users; staff drift to the more interesting technical jobs rather than to the ones with the most appealing applications.

Sitting and programming in an ivory tower might be a comfortable way of life but it is time for the computer professional to open up the technological "secrets" as quickly as possible before the tower is stormed.

It is in this context that the Saturday "fun event" at BCS 70 (this page), aimed at children and teachers is to be welcomed. The BCS has often been criticised for its contribution to ivory tower building but it has always shown a strong concern for the impact of the technology and its latest venture deserves widespread support.

FOCUS

THERE has been no shortage of studies recently each forecasting a critical DP staff shortage in the immediate future. Perhaps if less attention and related resources were devoted to the production of the many reports, some of the more pressing DP manpower shortage would be eliminated.

The National Computing Centre, in a new study, is forecasting a "looming crisis for DP" (CW, July 13). There is a confirmed shortage — not, as one might surmise, of writers, paper or printing presses, but of DP personnel. The NCC forecasts a need for 8,000 programmers and operators to enter the industry each year over the next few years.

Control Data Institute, for instance, is estimating a current shortage of about 20,000 and forecasts a need for 16,000 new entrants each year. Employment alarm bells have been ringing for some considerable time. At the beginning of the year, Computer Weekly held a recruitment conference and in an associated editorial, stated that imagination was needed to solve staff shortages.

Few, it seems, are aware of the DP employment market place. The social impact of computers, whether mainframe or micro, is seldom given recognition. Computing is spreading its grip and influence across industry, commerce and society. Whether it is the monthly computerised payroll, Data-Mate or washing machine, some degree of computer technology is involved.

Demand, meanwhile, is restless. New companies are setting up shop in the UK, creating a demand for high level skills. Small level computer manufacturers and suppliers are similarly marketing their products on a national scale.

Likewise, the services industry is expanding fast. It is hardly surprising that contract staffing organisations are flourishing with a consequent benefit to the DP industry.

As ever, it is DP management

which gets the rough edge of the data sick. Shortages, in the main, are at primary level of operators and programmers, and are a direct result of the earlier unenlightened times.

Training DP industry recruits has always been a bugbear which few installations can afford to undertake. By tradition, such training is left to the larger computer users such as the Post Office, banks, insurance companies and government. The mainframe manufacturers also contribute a healthy surplus to the balance of personnel surplus.

But these accepted entry methods are obviously not sufficient. A new entrant policy needs to be formulated with full-scale integration between education, authorities, the government and the industry. A training scheme as recommended (CW, January 19), perhaps triggered by a Neddly working party, is now even more urgent.

INTERRUPT

ONE day, a college bought a second-hand minicomputer and an elderly teletype. Although the system was increasingly heavily used by the students, funds were not available for maintenance.

So the only skilled attention the teletype received was when it failed completely and an engineer was called out. Consigning the hammering, the machine received, it functioned very well for several years.

Until one day when a subtle fault developed.

On starting the computer, the Basic Interpreter typed READY on the teletype. Failure to do so indicated that the Basic Interpreter was corrupt and needed reloading. A second failure to reload suggested that the bootstrap was corrupt too. A complete reloading should have cured the problem, but not on this particular day. The teletype functioned perfectly in Local mode but would not function online. This was serious.

Panic set in — all the keys were tried in turn, and then came a surprise. In addition to a paper tape feed, the teletype printed a character. When the teletype was then tried online, it worked like a dream. The cure was then added to the normal start-up procedure and no more trouble was experienced.

The moral: Here is may be the cause of Nothing at all. The teletype price for the entire system was £1,000. A lot of time.

Ten years ago...

COMPUTER WEEKLY
JULY 18, 1968

THE appointment of Arthur Humphreys as the first managing director of ICL was confirmed. Online control of operations was to be provided at Longannet mining complex in Fife, Scotland, with the installation of two Argus 400 services for application. A big expansion in sales of magnetic tape "encoders" in the UK was forecast by the managing director of MPS (UK). The latest of the new line of International Computers brought the sales total to £12 million. By the end of the year, first British produced exchangeable disc were expected on the market.

Taking computers a mass audience

LOW-PRICED accommodation in central London plus an all-inclusive programme provided to make the BCS 70 conference, Living With Computing, one of the most popular computing events for some time.

It is organised as a showcase for the work of the BCS specialist groups, and the steering committee under the chairmanship of Andrew Hinchley is aiming to appeal to a wide

and children.

On the preceding two days, specialist groups will be holding a variety of talks, seminars and presentations in three groups.

The ACM will be organising an intriguing session on social impact of computing which aims to take account of the effects of technology beyond the general level of recent discussions, towards examining one specific area.

For out-of-town visitors, accommodation will be available at the Institute of Education, in London at the very price of £7.00 per person (night bed and breakfast including VAT). The conference will be held at the Institute of Education, the Bloomsbury Centre Hotel, before August 31, the price for non-members is £20. Saturday event costs only £10 adults and £5p for children.

For full details, contact BCS 70 Conference Organisers, British Computer Society, Mansfield Street, London W1P. Tel: 01-337 0471.



audience with the three-day show culminating on Saturday, January 8 with a Computing Fun Fair aimed at a mass audience, particularly teachers

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For busy executives, a combined calculator and pocket-sized dictating machine has been introduced to the UK by Tashila. Pictured here, the dictating machine uses standard 30-minute miniature cassettes, has a cue feature, and can run off batteries or mains.

The calculator has a liquid display, memory, and four functions plus square root and per cent.

The whole machine is coded the KT-1360, and costs £109 plus VAT.

Amdahl tunes VM for MVS

By Tim Palmer

PARTS of IBM's VM/370 operating system have been retooled by Amdahl Corp in order to reduce the overhead imposed by running the large-scale MVS operating system under VM. Amdahl plans to announce its enhanced version within two months.

"I am not sure of the present overhead when you try to run MVS under VM, but it is of the order of 40 to 50%," Amdahl UK managing director Peter Williams told Computer Weekly. "Our target is to get it down to 10% or less."

VM/370 is an operating system which enables more than one IBM operating system to run simultaneously on the same mainframe in its own "virtual machine" (CW, July 6).

"Users who are converting to MVS but still have some unconverted programs would like to run the new and old operating systems side by side, and VM enables them to do this. The problem is that at present the overhead is so severe that it is very tough in a production shop," said Williams.

"It would also be very useful for users to be able to check out and debug a new version of MVS at the same time as running the workload under the old version. And of course we have a need to run many operating systems at the same time in our own computer centre, so an efficient VM would be very useful."

"What we have done is to recode parts of VM so that it handles interrupts from the prime operating system faster. In this case the prime operating system is of course MVS.

"For the secondary operating system or systems, we are prepared to accept the normal VM overhead, which does not matter for checkout or for running a few unconverted programs.

"Another thing that makes it easier for us is that our customers typically order a large number of channels (eight are

'Impeded by PO policy'

GROWTH of the UK computer and electronics industries has been seriously impeded by Post Office policy, says MP Andrew Lloyd, who has introduced a Private Member's Bill to amend the Post Office Act 1953.

Expert speakers expressed the view that the Post Office's failure to introduce advanced switching equipment meant that only obsolete equipment, that cannot be repaired, is manufactured here. They also claimed that the Post Office's monopoly had restricted the growth of computer communications.

Oswell Broome, former head of CTL, pointed out that the Post Office's yearly expenditure on telecommunications equipment is £800 million — more than the whole of the computer manufacturers' sales in this country. By continuing to order outdated Stovog exchange gear, the PO had prevented the development of modern products that could compete in overseas markets, he said, resulting already in thousands of lost jobs.

Andrew Lloyd, MP for the Conservative Party, said that the PO's failure to develop a common information policy along the lines of the common agricultural policy, to form a basis for the Information Society of the future.

The Forum is a group of backbench Tory MPs interested in learning more about computers and information technology.

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James Martin goes public...

For example, he said, the average Arpanet packet length is 218 bits of which 170 are control and routing bits belonging to the overhead, and only 42 bits are useful information.

Martin was in London to give one of his well attended lectures and to launch a new service aimed at the DP manager, which will provide further of his insights and explanations.

Called the James Martin Pub-

lic Report Series, the new service is offered in conjunction with London-based consultants Butler, Cox and Partners.

The aim of the series is to help DPMs to face the challenges of technology. As Martin says: "In the first report on networks and distributed processing, the DPM is likely to be faced with difficult choices in areas such as networking which has a multitude of changing standards."

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Called the James Martin Pub-

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4662 X-Y Plotter	242	182	151	
4954 Graphic Tablet	315	236	197	
4024	186	140	112	
4025	223	168	140	
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7245A Printer/Plotter	308	231	193

IBM PORTABLE COMPUTERS

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5103 Printer	130	120	108

TEKTRONIX GRAPHIC COMPUTING SYSTEM

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VT52 Descrope — either 20MA or 2124			
LS120	1069	86	64
LS120	1985	129	119
LA180 Serial	1649	150	111
LA180 Parallel	1599	129	96

2950 for private patients

AN ICL 2950, the second one to go to a customer, has been installed by Private Patients Plan at Tunbridge Wells.

The 1Mbyte system valued at £250,000 will run under DME/3

and take over handling of group subscriber files from the company's existing ICL 1902T. Individual subscriber accounting is to be added when development work is completed.



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DOWNTIME

by Chad

Talk-back at TV

I AM not sure that either the BBC or the IBA would approve of a new system being run by a Mr Roger D. Percy, in Seattle, for he has developed a scheme that allows viewers to "talk back" at the TV.

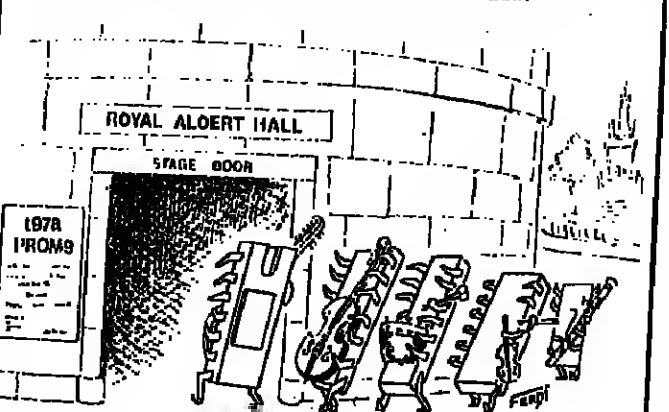
The "talking" currently has an extremely limited vocabulary, as each viewer can press one of only six buttons of a terminal to register the full gamut of emotional responses from ultimate joy to total despair.

Both the terminal and the TV are connected in a central computer system which moni-

tors the amount of time the TV is on, what channel it is tuned to, and what button has been pushed.

Mr Percy is, I understand, marketing a service based on the system to such companies as General Foods and Sears Roebuck as a market response analyser on TV programmes. Viewers have the option of turning off the TV to register the ultimate protest.

At the moment, Mr Percy has 35 families hooked up to the system, and is planning to increase this to 200.



Electronic money

I WONDER whether "Electronic Funds Transfer" will ever be really universal? If so, it will have to penetrate great many areas we have never even thought of. Witness the Malaysian woman tourist at Marlborough Street Court who was fined £3 for being drunk and disorderly in the West-End. Asked she: "Do you take American Express?" The magistrate replied: "It is not a matter for me, but I believe it is a very reputable company, and I think we can take a chance."

It turned out, however, he was wrong; courts cannot accept plastic money and the hunched lady had to pay with paper in hand.

Plastic money is still looked down upon in many circles, as was paper money in the days when we still had gold; surely electronic money will have the same problem?

Colourful launch

HEWLETT PACKARD claims to be concerned over de-Americanising its literature. At the launch of its small business system, the HP250, the company sported a French-produced special-announcement-HP250 ties and exactly spoke of Anglifying or denationalising program. "We removed references to Fanny Seem in the bicycle-spares program, but it appears we forgot Zip Code."

When later questioned about the optional colour available for housing, HP quickly strove to point out that "sweet potato" is in fact a red, many had been equally worried over colouring; he suggested salmon would equip themselves with the vegetable concerned.

But just how should HP describe the colour? Red Potato seems a bit lame.

Fall in the value of labour will require heavy taxation

IN taking issue with Derrick Grover (CW, May 25) over some of the points in his article I do not wish to detract from most of his analysis or his main theme—that we should look at a reduction in the cost of labour to solve the problem of technological unemployment. With the urgency of the present problem it cannot be stressed too often that this possibility has not had the attention it deserves, particularly among professional economists.

As C. G. Brainer points out there has been some work on negative income tax which can have the effect of allowing people to work and enjoy a reasonable standard of living even when the value of their labour is relatively low. Unfortunately, the economists that have done this work tend to be right wing and so tacitly agree with what Milton Friedman calls the liberal principle. This states that individuals are entitled to the product of their labour and the product of the goods that they own. Any attempt to tax the rich to pay the poor violates this principle so right-wingers would naturally be reluctant to agree with the large dose of negative income tax that will be needed to prevent large scale technological unemployment because negative taxes for the poor means high taxes for the rich.

It seems to me that certain right-wing economists must have known that negative income tax (sometimes called tax credits) could be effective in reducing unemployment but because they have had neither the courage to say that the poor must starve nor that the rich must be taxed they have contented themselves with dark hints about the monopolistic effect of unemployment benefits on the labour market.

This brings me to the first point that I wish to make about Grover's article which concerns his statement that industry ultimately pays for unemployment benefits. In one sense this is correct but industry is merely an intermediary: it takes labour

and raw materials and turns them into goods and any profit it makes is returned to the individual shareholders or taxpayers who own it. Any attempt to reduce unemployment by supplementary wages must, therefore, be paid for by taxes which must largely be borne by the more affluent.

As Grover points out, a policy which keeps a high level of employment will cost less than one which encourages mass unemployment, such as the present system does. In either case, however, the fall in the value of labour that this next industrial revolution is likely to bring about will require the raising of

duce a long-term effect by altering the accounting done by an employer is surely beyond doubt.

Indeed, given that market forces, and government controls, if necessary, can prevent industry from simply adding the subsidy to their profits, a blanket employment subsidy, if one paid to all workers, becomes merely the payment of a basic national wage through the pay packet. For those out of work the "basic national wage" would be paid as unemployment benefit.

For differences between a basic national wage and blanket employment subsidies we must

TABLE 2

Elasticity of demand for labour	Cost of blanket subsidy (per week)	Saving on unemployment benefits plus admin tax on paid in employment (per week)	Cost of reducing unemployment by one million
0.2	£416.0m	£76m	£340m
0.8	£138.6m	£76m	£62.6m
1.0	£83.2m	£76m	£7.2m
1.4	£59.3m	£76m	£17.7m
1.8	£46.0m	£76m	£30.0m

a considerable amount of taxation.

Secondly, I wish to take issue with Grover's claim that labour subsidies can only be a short-term measure and cannot perform any long-term function. Whether they are the best method to produce a long-term effect is a matter for further discussion. That they could pro-

look at secondary effects. A basic national wage has the advantage of implying that it is an income to which one has a right. Although the basic purpose of allowing people to work for a lower wage while enjoying a reasonable standard of living could be achieved by a basic national wage, blanket employment subsidies have some advantages which should prevent their use being completely ruled out. The main advantage is the possibility of them being introduced without raising the average level of prices.

It would, theoretically, be possible for the introduction of a basic national wage to coincide with a reduction in wages and an increase in taxation but it seems to me to be a difficult operation to manage. The introduction of a blanket employment subsidy, however, is a simpler operation since it need have no immediate impact on individuals. Tax raised and subsidy paid could be localised within each industry. The only immediate adjustment would be lowering of the prices for labour intensive goods and a raising of prices for non-labour intensive ones.

The main reason for presenting the case in terms of blanket employment subsidies is that there is some existing work on the subject. Back in 1924, the so-called "Cambridge" Professor Kaldor suggested that under conditions of heavy unemployment blanket labour subsidies could in principle create an

work by economists such as Santosh Mukherjee, the Oxford-based economist now working at the International Institute of Management in Berlin, has shown that if the effect of taxes not paid is taken into account as well as direct benefits, the unemployed receive in the order of 85% of their working wage. If this is the case, we can calculate the total weekly cost of a blanket subsidy scheme for different elasticity of demand for labour. See Table 2.

Unfortunately, there is no agreement among economists as to the magnitude of the elasticity of demand for labour. We have seen estimates which range from 0.08 to 2.0 and my guess is that in present circumstances it would be somewhere less than one.

In any case, this calculation is too simple to be taken too seriously and if given no estimate of the fall in prices which a policy would bring, what is really needed is a much fuller model of the economy which one could feed in various values of labour subsidies, and basic national wage, alongside changes in taxation, such as VAT, and obtain predictions of if not predictions, ranges of possibilities of the effects of the whole economy. It is a sad comment on the better known computer models of the UK economy, such as the Treasury Model, the London Business School Model, the Southampton Model and the Cambridge Model, that they cannot do this.

Brokers back Prime, DG and DEC

THE US minicomputer business looks good to New York stockbrokers Bear Stearns, and its investment research department highlights Prime as one of the three most promising performers, along with DEC and Data General.

DEC gets its vote primarily because of its growing strength in the end-user market. Bear Stearns comments that deliveries at DEC are down to 90 days and that cancellations have been flat on a year-on-year basis. Growing strength with large minicomputer sales to end-users is also noted for Data General, with the powerful new top-end Eclipse M/600 coming in for particular approval.

After the three industry leaders, there is a mass of second rank companies in the minicomputer market, but Prime stands out from the crowd in Bear Stearns' view.

"Prime continues to generate very strong booking gains," comments the banking house. "The company is gaining more visibility in the end-user marketplace with its excellent hardware and the best operating system in the industry."

Honeywell UK chief takes over

THE planned changeover at the top of Honeywell's UK subsidiary has now taken place, with Brian Long taking over as managing director from Russ Henderson, who has returned to the US.

Long joined Honeywell in March 1965, and 10 years later became director of marketing operations and planning. His appointment fulfils Russ Henderson's pledge when he took over from Steve Jerrits in the UK 18 months ago that his successor would be a Briton.

Henderson has now been appointed vice-president and general manager of marketing and services at Waltham, Massachusetts. He succeeds in this post Richard Douglas, who has moved to Phoenix to head the large systems division, where he replaces Norman Feldman. A new post, vice-president, corporate manufacturing has been created for Feldman.

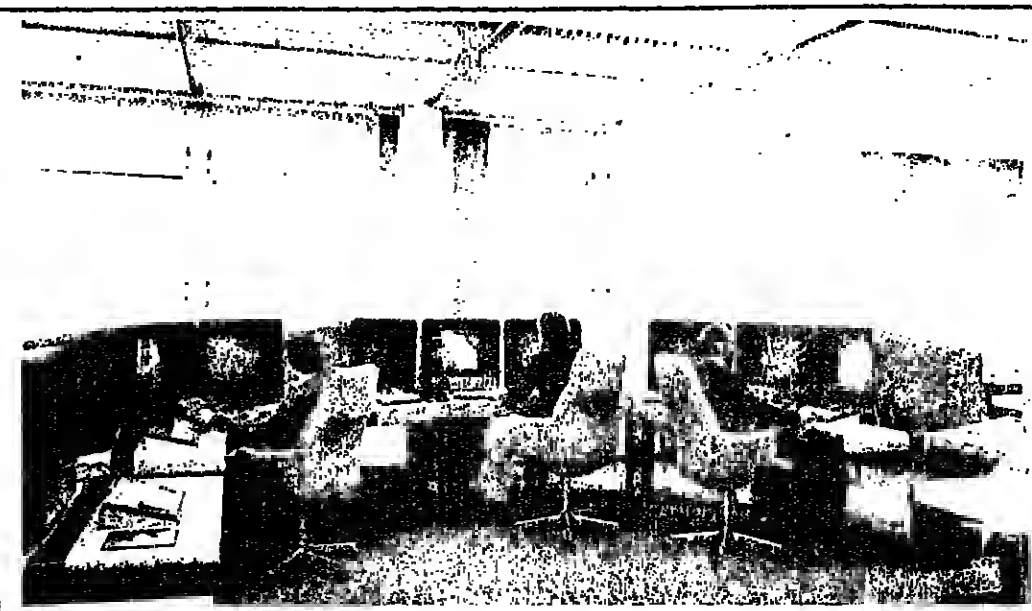
Motorola move

TO avoid appearing too directly as a competitor of its major customers, Motorola has moved its microsystems operation out of the main semiconductor facility in Phoenix, Arizona, and into Austin, Texas. The operation had been primarily responsible for producing the microprocessor development system for the 6800 family of components, but it has now sprouted a small computer systems business, a market in which many of its customers operate.

Leather firm wins ICL mini

ASPECIAL prize of a 1500 Series minicomputer has been presented by ICL to leather goods manufacturer Franco Fratelli of East Molesey, Surrey, runner-up in the Sunday Times Small Business Competition. The competition was to find a small business that would benefit by the injection of capital, which it would find difficult to raise on its own.

ICL looked at the six finalists



What we look like— from 36,000km in space

These meteorologists at the European Space Operations Centre at Darmstadt, West Germany, can see what the earth looks like from 36,000 kilometres out in space at half-hour intervals round the clock. This is because the display units in front of them are linked to an ICL 2980 system in the next room that processes digitised image information beamed down to earth at a rate of 800 Megabits an hour by the Meteorosat meteorological satellite (CW, February 8).

The two ICL 2980s at Darmstadt were supplied to the European Space Agency by ICL as part of a contract worth about £7 million.

This includes about £2 million worth of hardware and software from subcontractors like Siemens, which provided six 330 minicomputers, CIT Alcatel which supplied the display equipment and the display units, and Logica which developed a lot of the interfacing software for all this equipment.

ICL's biggest risk has been to develop a special operating system, VME/ESA, to enable the 2980s to work with the associated satellite control and monitoring equipment.

At the end of 1978 problems with VME/ESA led ESA to give ICL a deadline to sort them out, threatening to replace the 2980s with machines from another supplier, probably IBM. If ICL failed (CW, December 16/30, 1978).

ICL pulled all the stops out and in April last year the 2980s were accepted after a series of evaluation trials (CW, April 21, 1977).

ICL had about 90 personnel at the Darmstadt site at the peak of the project and there are still about 40 ICL software staff there supporting VME/ESA. ICL says that this number should soon be reduced considerably.

Growing US interest in the impact of viewdata

UNDERLINING the growing interest in viewdata in North America, some two dozen companies, among them Time Inc., Xerox Publishing, GE and Western Union, are subscribing to a multi-client study into the subject which is being undertaken by UK consultancy Butler Cox & Partners. The study, entitled Viewdata and Its Potential Impact in the USA, is being carried out in partnership with information systems consultancy Link of New York, and other clients who have signed up for the study include McGraw Hill, Dun & Bradstreet, North American Philips, Texas Instruments, Rockwell and Bell Canada.

The remaining subscribers, which include some even larger and better known, have asked to remain anonymous. "The first question we asked ourselves was how aware Americans were of viewdata," George Cox told Computer Weekly.

"This was at a time when In-sac had just installed its terminal in New York, and we found that in general Americans knew very little about it. Information about our planned study aroused some interest, but what convinced them that they needed to know more about it was the type and variety of organisations which have become information providers in the UK."

The study was started in May, and is about one-third completed. "We will probably produce an interim report at the end of July, and the main report at the end of September," said George Cox.

In-sac has assisted in the study, demonstrating the system to interested parties in New York, but is not directly involved because Butler Cox wants the study to be untainted by commercial bias.

In-sac believes that the UK Post Office has a lead of at least 18 months, and probably two years, in the development of the system.

George Cox is more cautious saying that once the concept is accepted, imitative systems will follow, that a system could probably successfully be developed for the PDP-11/70, and that the UK could have a clear lead of even less than 18 months.

Speaking from Link's office in New York, project leader Roger Woolf said that in the US viewdata was likely to begin as a number of fairly small systems, each aimed at a specific community, either geographic or special interest, and to expand from there.

To find the one that would benefit most from having a computer, and awarded the firm it chose a 1500 machine.

Proco Fratelli makes leather attaché cases and similar goods. The firm was described by the judges of the main competition as needing to improve its accounting, so the computer will be of particular benefit. It will be used for sales accounting and stock control.

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MICHIE'S PRIVATEVIEW

Machines must explain themselves



ONCE or twice in my life I have seen a frustrated user physically attack a machine, on one occasion mortally; the victim was a vending machine. Never was the offender given the chance to explain its misdeed, or non-deed. But who ever heard of a machine explaining itself anyway?

I do not believe that non-explaining machines can be much longer tolerated in our human world. If we do not know how to employ the new super-fast, super-complex systems with the gift of self-explanation, then it is time we drop them before it is too late — or started to find out how to converse with them.

The US philosophy for air traffic control envisages ultra-powerful database and scheduling computations encapsulated in giant "black boxes". What will the human supervisors do on the presumably rare occasions when the system's decision-taking skills malfunction? I trust at least, that they will restrain themselves from "vending machine" solutions, even if East Coast flights are mysteriously re-routed to Dallas or inexplicable groundings of harmless carriers raise doubts as to the system's sanity.

As control devices and their programs proliferate, their computations more and more resemble Magical Mystery Tours. And the human cargo? There's no reason why, so long as the system ultimately dumps them into some acceptable output state.

In European, as opposed to American, planning for air traffic control, rather than stand-alone black boxes, the preference is for non-machine systems. Human supervisors must at every stage be able to

ask the program: "What are you trying to do?" Lack of such query facilities has already led to the costly wreck of at least one advanced system for industrial automation. Supervisors at Royal Dutch Shell's Humber plant finally lost their nerve. Some even deserted their control stations.

Provision of query facilities as an antidote to machine inscrutability is not quite the straightforward matter which many imagine. Interactive diagnostics and trace routines, even when sprinkled with the very best synthetic sugar, do not necessarily suffice. Such things resemble orthopaedic shoes huilt to correct a patient's rolling gait. They may help; but if his trouble stems from a congenital abnormality at the hip joints, then the patient also needs reconstructive surgery.

Just as there are walkable and non-walkable skeletal structures in human anatomy, so there are explainable and non-explainable computations, and the differences can be traced to the respective program structures.

Impressive achievements have been scored by programs specialised for high performance rather than for self-explanation. But ask, say, a meteorological program why it predicted rain for next week, and what do you get? At best, one or the other of the two classical evasions: Either "That's the way the partial differential equations worked out," or "A match for this week was found from a database of thousands of past weeks, and the associated record retrieved."

Ask the same question of a human meteorologist, and although his predictions may not be quite as accurate as

some of the new weather-crunchers, he wins hands down on his ability to explain them in terms which make sense to another meteorologist. The two parties to the explanation share the same mental structures for storing and computing meteorological facts and theories.

Does this mean, then, that if we are to build explanatory bridges between machines and people, we must restrict our problem-solving programs to the human mould? That is precisely what it means. Either to act as replacement problem-solvers or as interpretive interfaces capable of modelling brute force operations in humanly intelligible terms. Both possibilities are under investigation in laboratories devoted to AI research. The turn towards programming systems based on "production rules" can be seen in this light.

Some have taken the opposite stand. In Sir James Lighthill's now famous "ABC," A was for Advanced Automation and C for Cognitive and CNS studies. He advised that work on B, for Bridge as exemplified in the context of that time by the Edinburgh approach to robotics, should be discontinued.

A new wind has blown. The Science Research Council's "Special Panel in Computing" is especially cheering. Pushed along by a panel of seasoned professionals, it offers a notable opportunity. The indications are that the panel will find a place for problems posed by machine inscrutability and for attempts to build conceptual bridges between human and machine problem solvers.

Donald Michie

SOFTWARE FILE-1

CICS testing pack launched by Circle

MORE details have now been released of Online Software International's interactive test controller for CICS. Interest (Software File, June 8). The successor to the company's Stop package, the software is available in the UK from Circle Computer Consultants.

As with Gemini's Oliver (Software File, April 27), a key feature of the system is that it protects live work from potential corruption by tasks under test. Test and production systems can therefore be safely combined in a single CICS partition.

The package also contains many other facilities designed to

simplify and accelerate testing in an online environment.

The system, for example, is capable of intercepting program checks and providing appropriate diagnostic information at the terminal. The terminal user can also examine and modify main storage as well as online files.

In conjunction with the latter, a useful feature is the ability to freeze task execution at strategic points for logic checking.

The system also provides an instruction execution trace and the capability to check for program re-entrancy.

Developed from OSI's storage protection package Stop, over 100 copies of Interest are said to have been installed at sites in the US and Europe.

Available both for CICS and CICS/VS, the software operates under all operating systems — DOS, OS, DOS/VS and OS/VS. It can be purchased outright for £4,200 and can also be supplied under leasing and rental plans.

The UK agents also distribute OSI's CICS/VS reference handbook (Software File, March 2). Circle Computer Consultants is at the World Trade Centre, London, E1 8AA. Tel: 01-488 2400.

RTZ help for Isam users

A PACKAGE developed by Value Computing to enable Isam users to realise the full potential of IBM's newer disc drives has been introduced to the UK and Europe by RTZ Computer Services.

Designated 3330-II/3350 native mode Isam support, the software allows users operating under Release 34 and above of DOS/VS to support Isam

on 3350 drives. It also provides Isam support on the top 200 cylinders of 3330 Model II drives.

Value's system supplies replacement Isam logic modules which are invoked automatically via modified Isam open transients. No program or job modifications are entailed other than in JCL file extent specifications.

Identical user interface makes for ease of upgrading

TWO application systems based on Burroughs equipment have been launched by Teleprocessing Computer Centre Ltd, of Slough. The systems, for purchase accounting and general ledger, can be made available either on a turnkey basis, operating on a B800 minicomputer, or as a real time bureau service.

Although the underlying software is not identical in each case, the user interface is, the company said. This joint offering thus presents an unusually attractive upgrade path.

Both systems are based on the principle of online file access and update, so that transactions affect the database immediately. Telepayments, a real time purchase accounting system, allows users to enter and verify invoices directly at a VDU and enquire about individual suppliers at any time. Remittance advice, cheques, and control lists are printed at the appropriate time in the user's office.

The system can be linked automatically to the general ledger package, Telegenral, which accepts and verifies journal entries online. In addition to a report generator, the system includes facilities for producing an operating statement, profit and loss account, end balance sheet.

Teleprocessing Computer Centre, which operates B2700 and B4500 machines, bases its interactive bureau service on the Mercury TP and database software developed by CEI of Toulouse (CW, June 10, 1978).

Puzzler

WHEN 1,108, 1,453, 1,844 and 2,281 are each divided by a certain number, the same remainder results in all four cases. What is this mysterious number and the remainder?

See page 45 for the solution.

SOFTWARE FILE-2

'Pay more attention to needs of end-users'

A CALL for computer scientists to reverse the trend towards increasing compartmentalisation and pay more attention to the needs of end-users was made this week by the father of Pascal, Professor Niklaus Wirth.

Professor Wirth, of the Institut für Informatik, Eidgenössische Technische Hochschule, Zürich, was speaking at York University after being conferred with an honorary doctorate from the Department of Computer Science.

"Computer scientists," he said, "are more and more relying on the mutual admiration of increasingly impenetrable circles of their peers. If we forget our primary role as toolsmiths — namely the creation of effective systems for users from other

disciplines — we are failing in our purpose.

"It is important to understand that computer science is a branch of engineering rather than of natural sciences. The name, which has been described as a 'harmless conceit', in practice reflects the high esteem in which science was held in the US in the early 1960s.

"In contrast to natural science, which builds in order to study, we study in order to build. It is vital that we perceive our role correctly if we are to attempt to judge our success."

Professor Wirth several times emphasised the significance of service courses run within universities for members of other disciplines.

Resistance to invariants in algorithm development

PROFESSOR Wirth met with some resistance in attempting to demonstrate the use of invariants in algorithm development.

He had previously expressed the view that program proof considerations should be carried along throughout the design process. The identification of invariants was one way of proving the program at the same time as developing it.

However, his example, a binary search algorithm, provoked the objection, from several that the invariant selected:

$\{A[i] \leq x \leq A[j], i+1 \leq j\}$ for searching an array $A[0] \dots A[N]$ was by no means obvious. Instead, it was argued, its identification depended on a considerable amount of previous experience and skill, comparable with that involved in selecting substitutions in integration.

Professor Wirth subsequently conceded that the use of invariants did not fall easily into novices' training courses. He had, however, successfully introduced the technique into refresher courses for scientists and engineers with a few years' programming experience.

Surprise enthusiasm for personal computing

A CLEAR enthusiasm for personal computing was a surprising feature of Professor Wirth's presentation. His excitement stemmed from a year's sabbatical spent at the Xerox research laboratory at Palo Alto where all staff members have their own minicomputer, the Alto.

Experience with this system had prompted him to initiate a similar project at the Eidgenössische Technische Hochschule, he explained. This project involved the department in building its own 84K word microcomputer system, including a cartridge disc unit and bit-map displays.

Hardware for these systems would be built round the required software functions and would include a microcoded interpreter for the only language supported, Modula 2. As much as possible of the other software would also be implemented in hardware, including facilities for text editing, file management, and testing and debugging programs.

The constant availability of a personal computer offered many advantages over a shared central service, he said. It also exposed computer professionals to the first time to computer-based tools for managing their everyday work other than computing activity.

Such experience was salutary, he suggested, as the computing community has not until now been noted for using the tools it developed for others.

One of the most valuable assets, he had discovered, was a highly effective text editor. The development project, apart from providing the tool required for the work of the school, would also be a valuable learning experience: one of the compartmentalised he most regretted in computer science was that which tended to deny software engineers any understanding of the hardware they use.

The things he said...

ALTHOUGH originally an electronic engineer, Professor Wirth is most noted for his contributions to the advancement of software, particularly language design and programming methodology. Some of his observations in this area included:

"Our knowledge about economy of design is now negligible, following the reduction in cost of computing equipment by decimal orders of magnitude over the last ten years. This has obsoleted time-consuming studies of optimisation."

"With the advent of the microprocessor, I expect to see the demise of the general purpose computer. Instead the most generally-used computers will be special-purpose microcomputers."

"Man has a traditional reluctance to change his toolset. An abhorrence to structured programming once complained to me 'What is your methodology Wirth if we like debugging?'"

Enhanced version of Modula on the way

PROFESSOR Wirth, who was responsible for the design of Algol W and Modula in addition to Pascal, revealed at York some details of an enhanced version of Modula, designated Modula 2.

Originating in 1974 with a project to investigate multi-programming, Modula 2 in a sense represented a merger of Modula with Pascal, he said. His aim, however, had been to develop a tool quickly for implementing system software, rather than specifically to develop a new language.

He had chosen Modula as a basis because of its more modern syntax and had added modules and processes suitable for expressing concurrent operations.

Specific borrowings from Pascal included 'pointer' and variant record features, and other extensions included facilities for set processing and FOR statements.

The language had been kept

deliberately skinny (excluding for example dynamic arrays) to minimise the size of the machine code nucleus required and it was intended that even the lowest level modules would be written in the language itself.

The computer science department at York University is known for its work on developing a highly efficient compiler for Modula on the PDP-11/40. A small, concise, language, it differs from Pascal primarily in its provision for modular as opposed to monolithic program construction. It is intended primarily for programming small dedicated computers used in a real time environment.

Professor Wirth, who noted that when designing a new language he always used it to write the compiler, interested many with news of a new compiler for Modula 1. Written in Modula 1 for use on PDP-11s, it was developed by Dr V. K. Le at Cem, Geneva.



There is no place on the horizon for interactive logical debugging. Interactive programming is the greatest destroyer of program quality and the use of interactive facilities should be restricted to the text editor for clerical tasks.

— PROFESSOR WIRTH

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PROGRAMMER NOTES

Why BOC thinks 1900 user's dreams are answered

THE ICL 2900 Series is a true program development machine, the answer to a 1900 programmer's dreams. Such is the feeling at BOC Datasolve at Sunbury-on-Thames, where a 3M byte 2970 is a run on a bureau basis, along with an Amdahl V5 (soon to be a V6) and multi-processor IBM 370/158.

According to Datasolve's customer liaison manager, 1900 users notice a tremendous range for the better with 2900. The changes are apparent in two main areas: ease of compilation and use of high-level languages in general, and debug facilities.

Compilation and leading are made easier because on the 2900 the programmer does not have to concatenate, or in 2900 terminology, collect — all external references for a routine.

Instead, object code is placed in virtual storage and the Cascade Loader takes care of unsatisfied references. The Cascade Loader in effect loads all referenced library modules at run-time.

On the debug side, gone are the well-worn memory dumps in octal and character form. The reason is the incorporation of an Object Module format diagnostic package, usable with any of the high-level languages.

The diagnostics package uses information supplied by the compiler. The extent of this information is governed by a programmer-specified diagnostic level code, used as a compiler option.

The package can report the line number within a routine where a failure occurred, the memory names and values of any variables, and trace the statement back to its root.

The stack oriented hardware architecture of the 2900 makes this root tracing simple, because each CALL and its parameters are logged on the stack.

Various errors are automatically caught with hardware traps, such as an index being floating-point overflow, and mismatching of TYPE in a CALL statement.

Even the languages are better implemented than in the majority of 1900 sites. Cobol, for example, contains declarative debug sections, which are only declaratively executed, perhaps on reference to a file or field name. A run-time switch governs their execution even when the dependent conditions are satisfied.

Even writing Teleprocessing applications

is easier on the 2900. Rather than use the 1900 Driver package with its special verbs and screen layout considerations, under 2900 Cobol the programmer uses ACCEPT and DISPLAY to read and write from the terminal.

A screen template ensures the program independency from layout considerations. TP programs are easily tested in batch, when the ACCEPT and DISPLAY verbs default to use the card reader and line printer.

In general, standard ICL 2900 software has proved acceptable for use on a bureau machine, but certain deficiencies have had to be countered.

One minor source of irritation is the accounting information yielded following a terminal session on batch run. VME/D records usage adequately but its reporting suffered from shortcomings and Datasolve has built its own system to produce weekly statistics.

Another problem was ICL's test data generator, which, being batch oriented, involved the online user in excessive work. Consequently Datasolve has written its own interactive version, which enables mistakes to be corrected as testing proceeds.

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• DEControl CA 88

• Teletype 33

• Teletype 43

• Teletype 35

• Mililom 1200

• Teletype 132

• VDU — 1001/2

• VDU — 1004/5

• Terminal 30

• Terminal 300/1200

• DEControl CA 88

'Cyber 170 is our product line for 1980s' says Control Data

FOR a company sometimes predicted as the next casualty in the mainframe computer business, Control Data is doing extraordinarily good business with its Cyber 170 large-scale mainframe product line — and making money out of it.

"Overall our systems business is as profitable as our peripherals and services business," says John Tittsworth, executive vice-president for systems at Control Data. "People questioned the need for over more processing power, but the models at the top of the line, the 171, 172, 173 and 174, are sold out through the first quarter of 1979. We have shipped over 200 Cyber 170s since July 1975, and are scheduled to ship about 100 this year."

"Orders are currently 30% up on last year and our backlog is up by 10%."

The Cyber 170 line starts at the 171, rated at about the same power as an IBM 370/148, and the top-end Cyber 176 is claimed to be 25 times as powerful.

"A 175-300 offers more power at the same price as IBM's 3033. When running a 70% scientific, 30% business application mix, a 175-300 rates 7½ times a 171, where a 3033 rates only five times. A 176 is about three times as powerful as a 3033."

The line represents a major effort on CDC's part to bring together and harmonise its mainframe operating systems. Two are offered on the Cyber 170 line: NOS, Network Operating System, and NDS Batch Environment. NOS is an improved version of the Kronos operating system introduced on the 6400, and NOS-BE follows on from Scope, which came in with the 6600.

"NOS is designed for heavy interactive time-sharing usage, and NDS-BE is of course primarily for batch working. But the two are becoming more compatible and will be merged into a single operating system," says Tittsworth. "The name may change, but the Cyber 170 is our product line for the 1980s."

Two years ago Control Data was talking about moving further into the general purpose mainframe market.

"We are strong in the scientific processing market and always have been," says Tittsworth. "But our users want to run their business applications on our machines as well. Indeed we have one West Coast customer who runs a 70% business-30% scientific mix on a Cyber 170, and in Europe, customers like the Danish PTT and banks in France and Spain run 100% commercial

applications on 170s."

The Cybers are 60-bit word machines with up to 256 K-words of main memory. On the 170, fast bipolar memory is used, giving a transfer rate of 27.5 nanoseconds for one word. Extended core storage of 512K, one or two Megawords, can be added.

The 176 CPU is built in emitter-coupled logic. It has a 12-word instruction stack and nine independent functional units, most of which are segmented. Thus several parallel pipelines can run simultaneously. It has eight 60-bit open end registers, eight 18-bit address registers and eight 18-bit increment registers, and much of the administrative workload is removed from the processor by use of anything from 10 to 20 peripheral processors. These each have 4K 12-bit words of memory and 12 or 24 input-output channels, each with a maximum transfer rate of 2 Megabits per second. The same basic architecture is used throughout the line, with slower, lower-cost components being used in the smaller models.

The most obvious requirement from the enormous processing power of the 176 is in weather forecasting, but they are also being used in seismic applications — "one major oil company wants two 176s,"

comments Tittsworth. "Ford is using one for work on engineering structures, and in nuclear research."

The 170 line as a whole is cornering the market in the high technology end of the petroleum industry, and in large power management systems for electricity companies. The legendary New York blackout last summer brought home the need for such systems to electric utilities. Even so, says Tittsworth, fewer than two dozen of the 3092 electrically supplied have such systems. The systems offered by Control Data require a dual Cyber installation and cost up to \$15 million.

The education market is also important for Control Data, and 13 universities which have never previously used CDC computers have installed Cyber 170s, and in manufacturing, 15 new users, including GE and Rockwell have put in orders have come from new customers," notes Tittsworth.

The systems business contrasts with the rest of CDC's activities in that it is predominantly foreign. Some 40% is done in Europe, 20% in the rest of the world — including two Cyber 172s to the Peoples Republic of China for oil exploration applications — and only 40% in the US. CDC is



By TIM PALMER

inactive in Japan, where no comparable product exists, and the company is currently reviewing the Japanese market.

As well as doing good business with large systems, CDC is a major user of its own mainframes in its services business, and this will expand with the growth of the Plato educational system. "They also help us to sell a large number of peripherals," says Tittsworth.

The experiment of charging customers according to the use they make of software packages — "usage pricing" — has yet to be evaluated, but CDC recognised early the growing value of software and charges all software separately.

A feature of the 170 line which brings Tittsworth great satisfaction is its reliability. "One hundred Cyber users were polled recently, and 75% gave them better than four out of five for reliability," he says.

Univac wins \$30m orders for 1100s

ORDERS totalling over \$30 million for large-scale 1100 systems have been announced by Univac. The orders come from Japan, Spain and the US.

In Japan, an \$11.4 million 1100/82 system is to be installed by the Kyushu District Agricultural Co-operatives, to handle banking and credit requirements.

In Spain, where Univac has a larger share of the market than in most European countries, a \$4.6 million 1100/42 will replace an IBM 360/40 at the Banco Espanol de Credito in Madrid. The bank already has two 1100s and an 1100/42.

Two national US contractors make up the balance. Andes 1100/42 is replacing a 360/58 at a Control Data 6800 at the National Oceanic and Atmospheric Administration. It will be used for marine geodetic data systems, and to produce economic reports for the National Marine Fisheries Service. Worth \$9.1 million, it is to be installed in September, and conversion is due to be completed early in 1979.

Communications for 38 active satellites is to be handled by a new Univac 1100/22 system to be installed at the National Aeronautics and Space Administration's Goddard Space Flight Centre in Maryland.

The 1100/22 will be front-ended by five Univac V77 minicomputers, and the contract is worth \$4.98 million total.

US Bill to reshape the comms industry

Cameron Davis reports from Washington

THE two-year-old promise by a US Congressional committee for a "hasenut-to-otie" overhaul of America's 1934 Communications Act has been fulfilled. And with its fulfilment has come another promise: sweeping changes will be made to the country's telecommunications policy and the industry structure.

The newly-proposed legislation would adopt, as official federal policy, open competition in the provision of all communications services. Among the Bill's major provisions are de-regulation of the communications industry; the ability for common carriers to provide non-telecommunications services through a separate subsidiary; the severance of equipment manufacturing operations from any common carrier that offers non-competitive telecommunications services; and replacement of the Federal Communications Commission by a smaller, more streamlined commission.

The Bill would mandate two major reorganisations within the US government. The FCC would be abolished, and in its stead would be a Communications Regulatory Commission. The new body would have 25 per cent fewer supporting staff members than presently serve on the FCC.

Further, the newly-created National Telecommunications and Information Administration within the Commerce Department would be replaced by a

The legislative proposal was introduced in the House of Representatives last month by California Congressman Lionel van Deelen, chairman of the Communications Sub-committee, and Florida Congressman Louis Frey, the ranking Republican member on the committee. Van Deelen explained to his congressional colleagues that the proposed Communications Act of 1978 would regulate the communications industry "only to the extent that marketplace forces are deficient."

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Further, the newly-created National Telecommunications and Information Administration within the Commerce Department would be replaced by a

new National Telecommunications Agency, which would operate as an independent policy-making arm of the executive branch of government.

As for the common carriers, the Bill would make competition fuller and fairer, the sponsoring congressmen claim. The proposal would allow "any common carrier" to provide any service which the new CRC deems telecommunications-related, if the service is offered through a separate subsidiary.



VAN DEELEN... legislative proposal introduced in the House of Representatives.

Three new models of Level 6 mini now available in UK

ANNOUNCED four months ago in the US (CW, March 3) three new models of the Level 6 minicomputer are now available in the UK.

The new machines are at the top of the line, and consist of the Model 43, which is little different from the 6/43 it replaces; the Model 47, which adds facilities in the Model 43 which make it particularly effective in commercial applications; and the high-performance general purpose Model 53.

Honeywell is offering 16K-bit memory chips on the Level 6 line, and the eight memory slots in the chassis will now accom-

modate a Megaword on main storage.

Disk drives with 256 and 128 Megabytes capacity have been added, which carry 12-disc packs as well as the existing 5-disc packs. A double-sided diskette unit completes the introductions, and some Level 6 cartridge disk drives have been reduced in price by about 25%.

The Model 43 starts at £5,500, the 47 and 53 at £14,000; the two high capacity drives cost £21,300 and £18,000 respectively; and the diskette drive costs £1,800.

Wang small mainframe launch

THE new Wang 2200 VS small mainframe has now been formally announced for the UK market, and for convenience has been packaged into three basic configurations, designated WCS/50, WCS/60 and WCS/80.

The machine is claimed to be the only processor in its class with a true virtual storage operating system, and to cover the performance range between IBM's System 34 and 370/135 machines (CW, June 22).

Principal target for the new Wang machine is likely to be IBM System 3 users wanting to move to interactive computing, and the machine will compete with DEC's PDP-11 line through to the 11/70, with the Data General Eclipse and Hewlett-Packard's 3000 series.

The 2200VS ranges in price from £40,000 to £300,000 in the UK.

IBM PoS system offers new-style receipts at Tesco

RECEIPTS like the one pictured right, with product descriptions as well as prices, are now being provided to customers at Tesco's Wellingborough, Northants, supermarket when their shopping is checked out using the IBM 3880 point-of-sale system installed there.

The IBM system at Wellingborough is the first PoS system to be installed at a Tesco supermarket and will be used to evaluate the technique and to determine customer and staff reaction. The EPOS, Electronic Point of Sale, project, as it is called, will last two-and-a-half years, after which long-term decisions will be taken on the wider use of PoS, according to Tesco.

Tesco plans to evaluate laser scanning of bar coded product numbers pre-printed on grocery items, but at the moment it is labelling each of 5,000 items at the Wellingborough store with a unique eye-readable product number.

The number is keyed in at the check-out by the cashier and relayed to the back office minicomputer which looks up the price and product description from a file on disc. This information is then transmitted to the check-out and printed on the receipt. When the IBM 3032 and 3031 mainframes cur-

QUICK-JEL	.094
PKT CAKE MIX	.264
SUGAR STRINGS	.17
TOTAL	3.39
CASH TEND	3.50
CHG DUE	.11

17/06/78 10:37 3368/3
CHECK OUT TESCO PRICES

rently being installed by Tesco at its Cheshunt, Herts, headquarters are fully operational the day after the Wellingborough will be updated via a Post Office link to Cheshunt.

The IBM mainframes are replacing existing equipment at Cheshunt that includes three ICL 1904S machines (CW, November 17, 1977).

Banking terminal enhanced

AN enhanced version of its well established banking terminal system has been introduced by Datasab AB, and the Swedish company's UK subsidiary has installed its first Alfaskop VDUs.

The new banking terminal system is called the D18/10, and is built around a new Datasab processor based on the company's D5 minicomputer. By contrast the new D18/30 business system uses a Computer

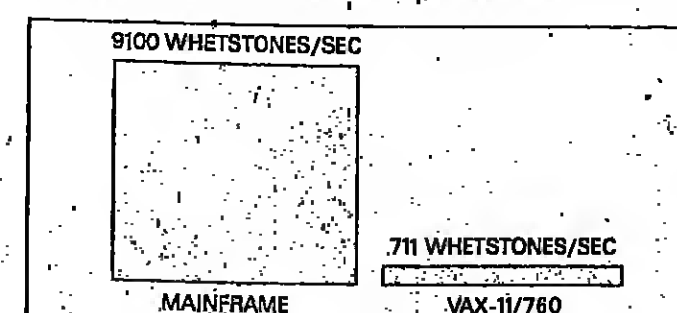
Automation mini. The D18/10 offers full software compatibility with the existing systems, and comes with intelligent workstations based on the Intel 8080 micro.

Customer for the Alfaskop is S. Hilton of Preston, UK distributor for the high-quality carpets manufactured by Ege Tappet of Denmark. The terminals are used for stock queries and order processing.

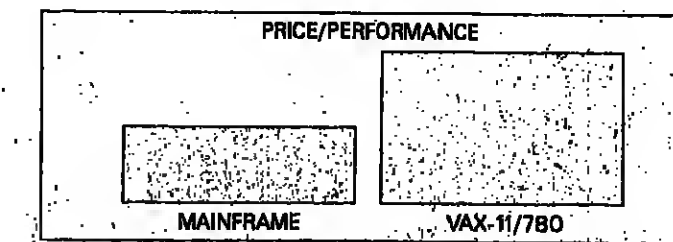
Digital's VAX-11/780 takes on the world's leading scientific mainframe.



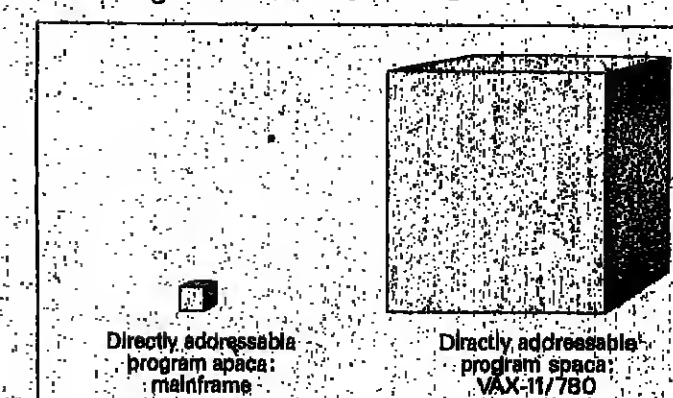
Round one to the 60 bit mainframe: Speed. The mainframe is still the speed champion with 9100 Whetstones per second.



Round two to VAX: Price/Performance. The 32 bit VAX is the world's fastest mini. A VAX system runs 711 double precision Whetstones. That's one twelfth the speed — at one twenty-fifth the cost. A dozen VAX systems could equal the throughput of the mainframe system — and you'd still save literally millions of dollars.



Round three to VAX: Program size. Virtual addressing and a gigantic 32 bit address size, compared to the 18 bit address size of the mainframe, allows VAX a directly addressable program size that is — are you ready? — 1000 times larger than the mainframe.



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'Carbonless' means greater security

A SUPERFICIAL appraisal by the computer department will naturally conclude in favour of one time carbon as against carbonless paper on grounds of cost, for Idem computer forms can cost up to 30 per cent more. Raw material costs alone, however, give a distorted picture, and a more meaningful appraisal would be made under the heading of "Total Systems Costs," taking into account

various savings within the stationary system as a whole, made possible by the use of carbonless paper. The Idem Division's marketing team has been putting over the total systems costs story at seminars held for computer people for some time, and the story can be simply summarised. Take the performance of Idem on computer output printers.

Because there are no carbon interleaves, more copies are obtainable. You will get up to eight parts on an IBM 1403, and to get the same number using carbon would require a grade of carbon paper far too expensive to use on computer, such as one of the plastic backed film carbons.

It is in this sort of comparison that the systems costs argument shows an economic advantage for Idem. It is true that you may not need eight copies, but if you do you will need two runs with one time carbon as against one with Idem.

Another hidden expense of carbon stems from its innate "dirtiness" and tendency to smudge. After all, it is accepted that the economics of computers are largely based on savings on manpower and simplification of office systems.

Needless to say, this problem does not arise with Idem. With carbonless paper the copy image is within the paper rather than on its surface. It is therefore completely smudge-proof. Nor does it suffer from lost information due to carbon sheets that break loose from crimping — "carbon wander."

Furthermore, with no carbon to shred or otherwise dispose of, the computer department is saved one more time consuming and expensive operation.

Unshredded carbon, the extra copy, is a security risk. For example, I was once passing in building occupied by a well known credit rating firm and outside the entrance a sheet of carbon lay near a dustbin. It contained a readable copy of an intimate credit analysis of a large company. When I telephoned the company's managing director, he was, predictably, horrified to learn that his company's private financial affairs were lying on the pavement of a busy London street.

Of course, carbon disposal can, in a large installation, be quite a headache. Someone is required to move bins of waste carbon at fairly frequent intervals, for 10,000 five-part sets, eight inches deep, contain nearly 9,000 yards or just over five miles of carbon.

Certainly, it is not always easy to quantify the precise economic benefits of efficiency and cleanliness, but five miles of waste can easily be costed. Also, without the bulk of interleaved carbon there is a distinct saving on storage costs.

Two identical-size standard boxes will take 200 to 250 six-part carbon sets and 350 six-part Idem sets. For the computer operator, it can easily be demonstrated that this factor alone brings about operational cost savings.

Longer packs mean fewer stops for reloading. This may not appear significant until you consider the following comparison based on a mean average running time cost of £1 per minute.

With OTC, packs containing 250 sets would require 40 stops in the course of a 10,000 set run. Idem packs, at 350 sets per pack, would require only 28. One reload would involve an average of 2.5 minutes, at a cost of £2.50. An additional 12 stops needed for OTC would cost £30 per 10,000 form run, a formidable on-cost for a high volume department.

Following on from that it should be remembered that every time stationery is loaded on the computer printer there is a wastage of several sets of forms — both the tail end of the old pack and the feed-in of the new pack. Over a few months, this wastage is significant —



By Keith Flack

The headache of carbon disposal and the security risk of unshredded carbon are only two of the problems avoided with carbonless forms, says Keith Flack, marketing adviser with Wiggins Teape Idem division. "Total Systems Costs" can also reveal various savings within the stationary system as a whole.

approximately 72 sets per 10,000 set run using OTC.

Nor should one forget the complex area of computer ancillaries: decollators, bursters, guillotines, folding and inserting machines.

On all of these, carbonless performs at least as well as other papers, while on decollators it has the considerable benefit of less loading time.

These then are very briefly the sort of hidden savings apparent from total systems costs analysis, but that in itself is not quite the whole story.

The nature of the carbonless product creates opportunities for the computer operator to streamline his system, and simplify things in his own savings.

Where a multi-part form calls for information to be screened out of certain parts of a set (a good example would be a combined invoice and delivery note set where costs and discounts may not be required to be shown on the delivery note) Idem can be very simply de-sensitised in areas where a copy is not wanted.

True, forms designed for use with OTC can have sections blocked out or covered with the scramble pattern, but this renders that part of the working surface unusable — thus calling for more expenditure on larger forms to carry the same amount of information.

Where confidential information is being transmitted, for example pay advice, invoices and statements, Idem makes possible the simple and economic hidden entry system processing a sealed carbonless envelope through an output printer in one operation.

With the use of Idem Monoform or Action self-imaging papers, it also makes possible a host of ribbonless entry operations on both output printers and also on input printers like credit card sets.

Vital part in payroll service

COMPUTER stationery is playing a vital role in the development of one of Europe's most successful computer payroll services. The stationery, designed and produced by BFC (Continuous Forms) of Cradley Heath, West Midlands, plays an integral part in Payfact, a payroll system which has become an overnight success for European bureau, CMG Computer Management Group (UK). Payfact attracted 100 subscribers in the first week of its operation, following the launch

User must get to know his forms manufacturer

NO feature dealing with computer supplies would be complete without a reference to computer stationery, that important commodity which so many DP managers take for granted until it fails to be delivered on time or does not match up to the expected quality.

Stationery represents only 6% of an average data processing budget, according to a 1977 BIS Marketing Research Survey. And it is perhaps for this reason that its design and purchase do not always receive due attention.

Where the dialogue between computer and purchasing functions is good then probably little is lost, but when it is not, the criterion for buying forms is often reduced to a matter of price and the computer function is cut off from a vital source of information — the forms salesman. Thus forms may not meet the needs of the computer department and become extremely expensive!

It is unfortunate that some purchasing officers, particularly those with little knowledge of print buying, assume the attitude "what's so special about continuous stationery — it's only paper with holes down the side." As anyone who has had experience of buying knows, there is a lot more to it than that, including a wide variation in the standard of product and service from computer stationery suppliers. This is hardly surprising as the business forms industry of today has an annual value approaching £80 million.

However, the industry itself is doing much to rectify this. In 1969, the continuous business forms manufacturers section of the British Printing Industries Federation was set up with the aims of increasing efficiency and profitability within the industry and to provide a means of formulating views on questions affecting it. Its membership, of just under 80, includes nearly all the main computer stationery manufacturers and it is represented on a number of influential bodies in industrial relations and standards, including International Association, and also liaises with computer users' associations.

The current chairman is Cliff Brown, managing director of Roffa Print. The opinions given in this article are his personal ones, but nevertheless, they provide an interesting look at the current state of the industry and how "forms users" can make the most of their suppliers.

One of the fundamental reasons for the diverse standards, according to Brown, is that there are so many comparatively new suppliers of business forms in the market who lack the experience which is so essential to produce this complex product. The earliest suppliers were already manufacturers of business forms in the days before the widespread use of the computer. They were the producers of accounting systems, register sets, etc., used to working to close tolerances and printing from the reel, so they could change to continuous without too many problems.

During the 50s and 60s, most computer stationery was made by this small band of suppliers who invested heavily in equipment and development, working closely with the relatively small number of computer manufac-

turers and their customers. Soon they were joined by a few new manufacturers who entered the arena with a specialist product or because they were producing sheet fed forms and could see the change taking place in their market.

The situation became more complicated in the early 70s. The forms industry twice found itself stretched to capacity through extra demands placed upon it, first with the change to decimalisation and later the introduction of VAT.

At the same time, there was a downturn in the general printing industry and some jobbing printers who had no previous experience turned to what they thought was an expanding market — in fact the printing industry in general is notorious for buying equipment without first thoroughly examining the market.

Then in 1974, there was an apparent paper shortage accompanied by panic buying and overstocking followed inevitably by de-stocking and overcapacity in the business forms industry. This led to the classic case of a once healthy, efficient industry becoming a few years later, if not sick, certainly "one degree under." The pressure on prices forced two of the early market leaders to close and a couple of others to cut back capacity rather than fill their machines with work at unrealistic prices.

Nevertheless, throughout this difficult time, some companies have come through unscathed, refusing to lower their standards and continuing to invest in new equipment. In fact, the business forms industry is still one of the best equipped sectors of printing with a very high level of investment in new machinery.

In the opinion of Brown, what will emerge — and the signs are already there — is a slimmer industry made up of the original forms companies that are left and those later entrants who have specialised. Today, specialisation is the name of the game, whether it be in the area of run or a particular product.

What does all this mean to the user of computer stationery? First of all, that he has to get to know his forms manufacturer. Choosing a stationery supplier is almost as important as choosing the hardware and it is worthwhile getting to know the forms salesman, whether he be from a manufacturer or an independent forms distributor.

All too frequently, this most valuable and inexpensive source of advice is ignored or called in too late. A producer's advice will be sound and practical: it will frequently lead to improved design and faster deliveries and it could save a lot of money.

If called in at an early enough stage, a forms producer will ensure that the buyer does not receive a specification which causes needless expense. It is often easier and cheaper to design the whole form right from the initial O&M stage than to try to produce output in a format which has been drawn up with no understanding of printing methods and techniques.

There has been a great deal of investment in development work and equipment for products such as continuous envelopes and other mailing products, computer letters, check digit numbering on input docu-

ments, etc. Some stationery may appear to be more expensive than that being used previously, but in the long run this could save money if the user department can simplify clerical procedures and improve efficiency.

A visit to the printing works is well worth the time to meet the "inside people" and to gain a basic understanding of the factors involved in stationery production. A little knowledge can explain the sometimes mystifying differences in quotations, why machine proofs are so expensive, the high cost of corrections and why it is worthwhile not to order in too small quantities.

A few notes on some of these aspects will illustrate the point. These fall into three main areas: printing techniques, number of colours and paper.

Modern printing presses run at high speeds but have a long make-ready. The term "make-ready" or "set-up time" is the time required to prepare the press for printing, usually a minimum of three hours, yet a run of 40,000 forms may only take an hour to roll off the machine. There is, therefore, an optimum point, which will depend on the individual form and press being used, between run length (and capital tied up in stocks) and unit cost.

The continuous business forms manufacturers' section of the British Printing Industries' Federation was set up in 1969 with the aims of increasing efficiency and profitability within the industry. Its membership includes most of the main computer stationery manufacturers, and the current chairman is Cliff Brown, managing director of Roffa Print who, in this article emphasises that the opinions expressed are his own. But they offer an interesting look at the current state of the industry.

It is for a similar reason that machine proofs are expensive — the press either has to be left idle awaiting approval of the design or the set-up has to be repeated. As a rule, the more complicated the form, the more worthwhile it is to consider larger quantities.

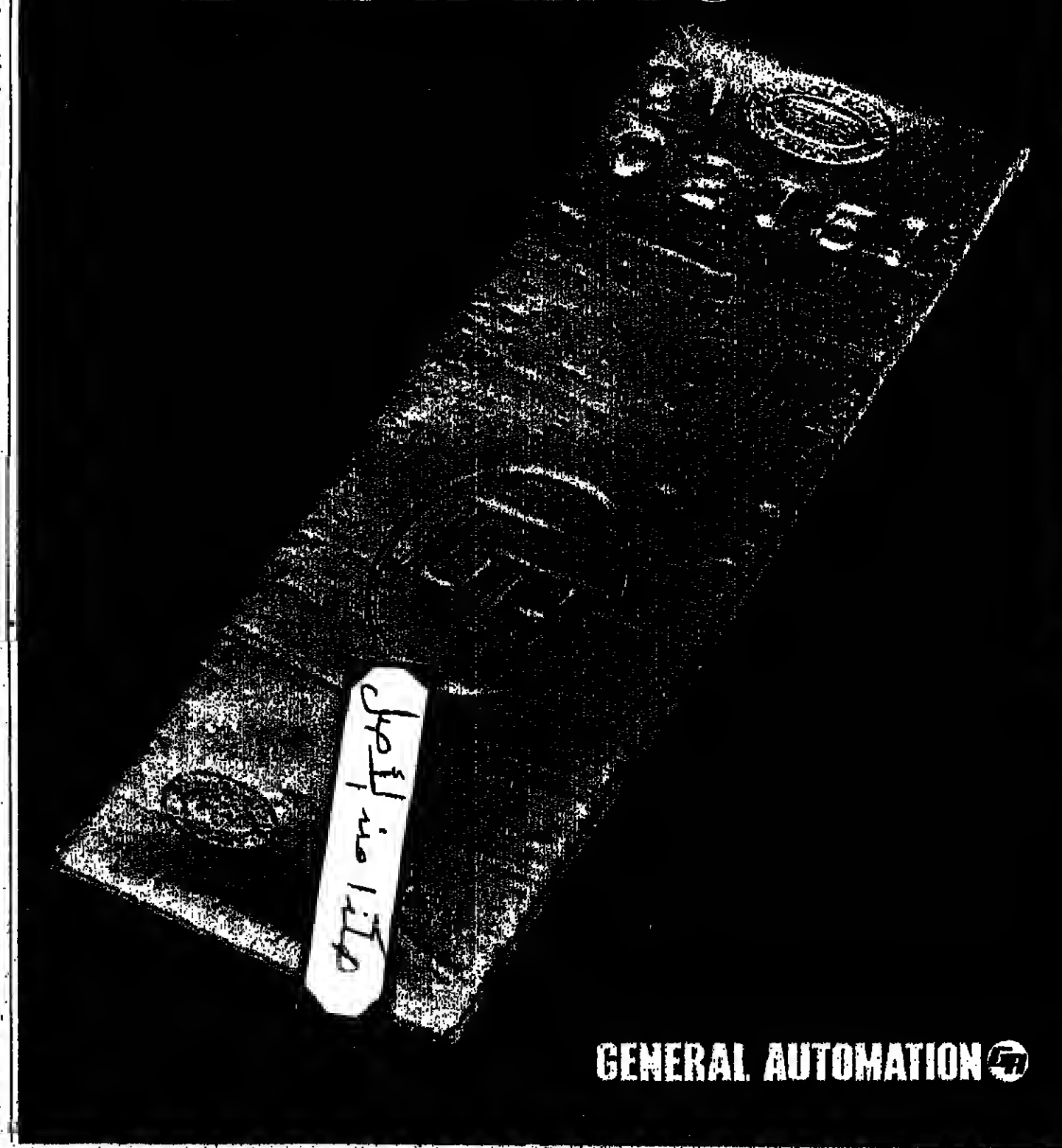
Obviously, the greater the number of colours involved in printing, the higher the price. However, if a producer is to run a job on a two colour machine, he may be able to offer the second colour at little extra. Another technique is to use screen tinting whereby a two colour job can give the impression of four colours. The forms salesman is familiar with all these facilities and can advise just what is available.

The cost of paper remains a vexed question in this area of printing. In the early days of the industry paper was cheap and computer printer time scarce. Now it is the reverse and it may be worthwhile to consider printing twice on the computer rather than running a two part set.

No forms producer can afford to keep stocks of all the different paper sizes, weights and tints. With colour, there is about a 12% difference in price and the more exotic the shade the more expensive the stocks. A producer will often encourage a purchaser to buy large quantities by the reel rather than by the number of forms; rather than be left with small, unusable quantities of special paper.

From the few examples above, it can be seen that once having chosen a forms producer, it is vital to discuss in detail the actual requirements. He will have the experience to draw up the final specification. After that, all the purchaser need do is place the order — and relax.

The micro-computer in BANKING



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PERKIN-ELMER Data Systems

investigate job-hunt complaints

LORRAINE KING's article (CW, July 6) describing her attempts to change jobs, mentions the CSA in connection with the interview she attended with recruitment companies. She implies, at least, that one or more of the companies were CSA members.

On behalf of the recruitment division of the Association, I invite her to lodge any complaint she may have with us for investigation. We, in the meantime, are investigating within the Association to discover the facts and see whether any changes are required as a result of the facts shown.

ALAN BENJAMIN
Director-General
Computing Services
Association,
Craven House,
121 Kingsway,
London WC2.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

Threat to personal privacy from the State

YOUR Computerview (CW, July 6), claiming that a threat to personal privacy does not come from the State, is incorrect. In 1963, Lord Denning defined it as those who "would contemplate the overthrow of the government by unlawful means", a statement that has a clear and precise interpretation. The present Home Secretary, in two recent official reports, de-

fined subversion as "action which threatens the safety or wellbeing of the State and is intended to undermine or overthrow Parliamentary democracy by political, industrial or violent means." Accordingly, "the Special Branch collects information on those who I think cause problems for the State" (see Hansard May 24 1978 (1700)).

Those definitions of "subversion" and "problems for the State", will vary from Home

Secretary to Home Secretary, and will have no force of law unlike, for example, the Suppression of Terrorism Act 1978. These definitions essentially oblige the Police in certain circumstances to take note of the activities of people who have not committed any offence.

An editorial in Police Review (9/5/72) accepts this as inevitable. "Much of the information is personal details of the suspect, his family associates, way of life etc, which trespass on the free-

dom of the individual but is the bread and butter of successful policeman."

Computers and databases play an important part in the dissemination and gathering of information. I think the Sunday Times was right to highlight the possible dangers of centralised information.

C. N. M. POUNDER
Edinburgh
The Computerview did not say that there was no threat to privacy from the State — Editor.

ACM boycott 'misunderstood'

MUCH as I agree with the sentiments of Professor Michie's telegram, the point of the ACM boycott has been misunderstood.

If individual scientists were ousting Scharansky from his profession then the personal approach might carry some weight and have some effect. However it is the Soviet government which is initiating the persecution. As such it requires the strength of an international

boycott to carry home the message and to apply internal pressure. It requires a very strong individual to stand up against a totalitarian regime within his own country, particularly when the result of such opinions may well result in loss of profession, and civil rights.

The Irish analogy is specious since the British government neither initiates, combines nor supports torture in Northern Ireland. If it did then I suggest

that those in the Northern Ireland computer industry might well appreciate the support of groups such as the ACM and view individual protests as well meaning but useless.

A. W. OPPENHEIMER
Brighton.

The Editor welcomes letters on subjects published in Computer Weekly or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

Worth a mere twopence

I AM glad to see that you appreciate the difference between the internationally agreed abbreviations M and m for mega- and milli- ("downstairs") July 6.

I am therefore very disturbed to find (on the back page) that the Department of Industry consider that microprocessors support to only worth twopence (£20m).

J. S. GATEHOUSE
GPCO product manager, Small Systems
ICL, London NW1.

OP SPOT

Working with ICL and Amdahl

FOR a building originally designed for use as a supermarket, Datasolve House in Sunbury is an impressive computer centre. Security is tight and it accommodates customer support and systems programming staff in addition to the operations and data control personnel necessary to run the company's ICL 2970 and Amdahl 470/V5.

The 470/V5 is the first Amdahl machine to be installed by a company in the UK, and Datasolve uses it to provide online bureau services under TSO, such as APL and RJE.

Like the two 370/158s, the dual processor configuration at Datasolve's Oxford Circus site, the 470/V5 runs under IBM's MVS operating system. So the company has transferred a number of its operations staff from that site to Sunbury in order to run the machine.

One such person is Bob Sketcheley, a shift supervisor who has been in the employ of Datasolve for four years. We had a brief talk and he compared the 470/V5 with the 370/158s from the operator's viewpoint.

"Quite simply," he said, "the Amdahl is in a class of its own. For example there is one job which used to take two-and-a-half hours on the 370/158s and now takes about 40 minutes on this system."

In fairness to IBM I must point out that a more valid comparison would be between the IBM 303X series and the 470/V5. However, Sketcheley's example does indicate the power of the Amdahl processor in practical terms.

In the main, staff at Datasolve House are dedicated to one or the other of the two systems. Head of the entire ICL operation is Mike Gardner who explained how his department is structured.

"I have a staff of 40, which comprises systems programming, customer support and operations."

He described the operations section. "Mike Bower is responsible for the actual machine, and we have a chief operator, three shift leaders, plus three operators per shift. There are also two line controllers for the TP network."

On the day of my visit shift C was on duty and I spoke to shift leader Reg Miles who explained how the 2970 workload is structured. During prime shift it is split up in the following manner:

About 45% is dedicated to work for MAC, an interactive, multi-access system with database. Basically it is used for program development and editing. About 30% is taken up by Transaction Processing, a real-time, interrogation, update and report production service which

builds a database and permits the manipulation of data.

The remainder is shared between batch work and RJE.

Miles next told me about the operating systems he has used in the past and compared them with that currently running on the 2970: VME/B, release 5X27.

"I have operated under ICL's George 1, George 2, George 2+ and the Manual Exec, and life is much easier with VME/B. The reason for this is that the system schedules its resources dynamically but leaves the operators in overall control."

Datasolve operators have been trained to a greater technical awareness of VME/B and we have at least one person on each shift who is an expert at 'dump cracking', regardless of the fact that the development of VME/B has gone smoothly."

He went on to describe the procedure followed by operators when a system error occurs.

"First, we determine whether it is hard or soft. In the case of a hardware error, we find which

ONE OF A SERIES OF OP SPOT VISITS TO INSTALLATIONS TO MEET OPERATIONS STAFF AND DISCUSS THEIR WORKING ENVIRONMENT.

unit is responsible and reconfigure the system as appropriate.

ICL engineers are on-site from 8.00 am to midnight, after which there is always someone on standby who will get to the installation within an hour of being contacted by the operators.

Miles continued, "In the case of a software error we contact either customer support or systems programming, depending on whether it has been caused by a user job or the system itself."

In the case of a problem with the operating system, one person who is likely to be contacted is Sue Darlow who has "been

involved with VME/B right from the very beginning."

She said, "We depend greatly on the operators for our diagnostic information. With VME/B, system loops are one of the most difficult problems to resolve, and the operators must be careful to trace the loop properly so that we can sort out the cause."

"As for system dumps, the operators hand them over to us while they are on prime shift, but on the night shift they usually look at the dumps themselves. We are on call should a serious problem arise."

RJE links to the system are co-ordinated by two line controllers, one of whom is Chus Collison, transferred from data control at another Datasolve site.

He said, "Basically, I connect customers to the 2970, ensuring that the discs to be used are on the system, and that the appropriate lines are available."

Describing his role in greater detail, he added, "At any one time we might have seven or eight MAC customers online, each using both VDUs and the slower teletype devices. The system shares the available resources between such users and the transaction processing and RJE work."

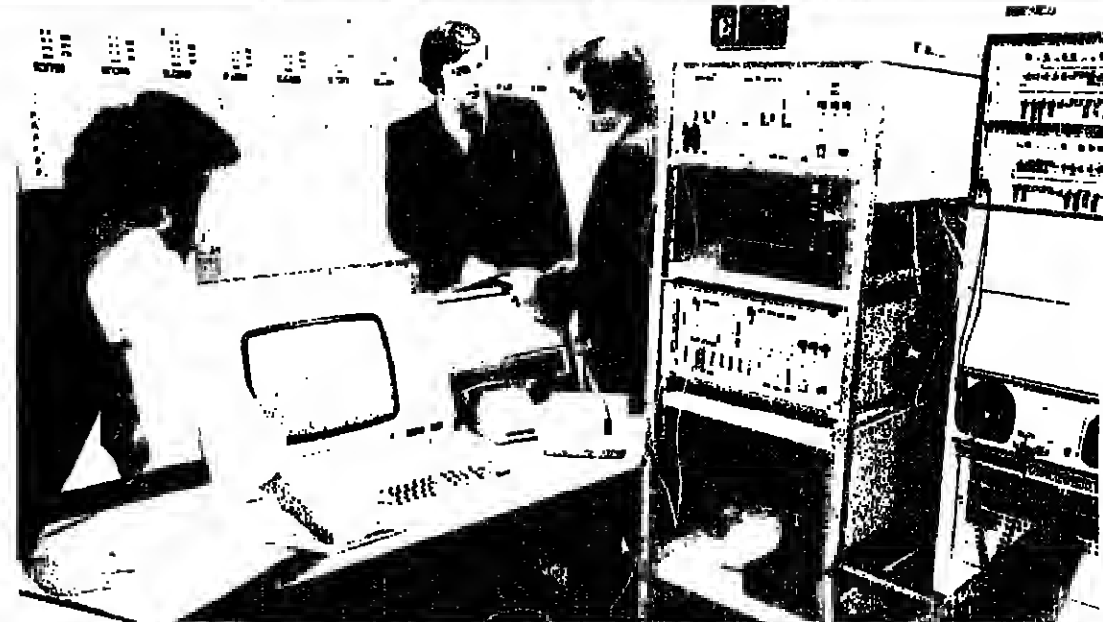
The telecommunications software of VME/B has been the object of much criticism, so I asked Collison to relate some of the problems he faces in this sphere.

"Difficulties sometimes arise when we try to reconfigure a line after it has gone down. We overcome this by repatching the line or, in other words, switching it to another channel," he said. According to Collison, the users experience no inconvenience when this occurs, and the fault is expected to be eliminated with the next release of VME/B: 5X32.

The line controllers work from 8.00 am to 6.00 pm, after



Bob Sketcheley, a shift supervisor... "the Amdahl is in a class of its own."



At the ICL controllers' station, Chus Collison (on the left of the picture) carries out a hardware check-up, as shift leader Reg Miles and Chus Collison discuss the 2970 workload.

which the mainframe operators take over, "as they are trained to look after that side of things," as Collison puts it.

Although Amdahl 470/V5 and the ICL 2970 are treated as separate operations, the operators do get trained on both machines. This adds further interest to the work and provides cover in the event of holidays and staff sickness.

Dave Brown, a senior operator working with the ICL machine, said, "The Amdahl is a very interesting machine — definitely faster than the 2970. Also you have to communicate much more with the 2970 than the Amdahl."

After spending three weeks working on the 470/V5, Brown wrote an operators' guide to the system, or a "nobby guide" as he calls it.

Data control is the one section where the Amdahl and ICL systems are dealt with by the same staff on a full-time basis. I spoke to Richard Gabb, the data control supervisor.

"It doesn't really matter to us which machine the work is to be run on because the procedure we follow is the same in both cases," said Gabb.

"We receive 'over the counter' work, we have a quick look at the job card to see that it's all right, and then we submit the work to the system. The user will specify whether or not any errors are to be corrected by us."

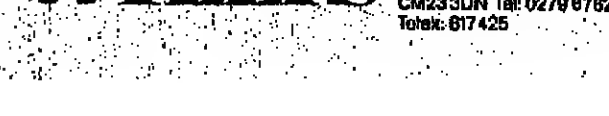
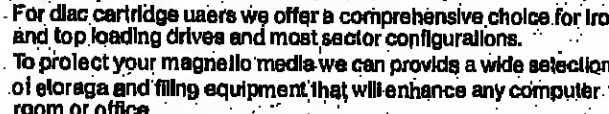
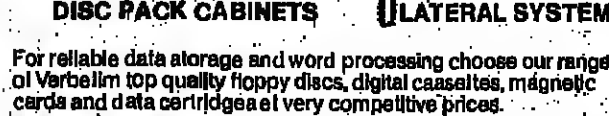
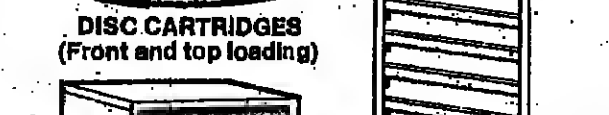
The section checks all work printed in-house to see that it has run properly and that the output is complete. The work is then sent to the user by first-class post or delivered by van.

BCS Group

THE operations Specialist Group of the British Computer Society is in the process of drawing up a schedule of its meetings for the coming year. It should be ready by the end of July.

Any person who wants a copy should contact Barrie Patman, BOC Datasolve, 14 Old Park Lane, London W1. Telephone: 01-499 7090.

magnetic media from WILLIS



Scharansky: A British reaction

I am very heartened that you decided to devote Professor Michie's Privinterview (CW, July 6) to the plight of Anatoly Scharansky, and would like to add my name to your telegram.

However, I must strongly disagree with the view expressed on the rupture of scientific (and possibly other) relations with Russia. I feel that your view of the supposed reactions of British

scientists were the situation to be reversed, is a narrow-minded one. If the boot were on the other foot, I for one would not feel that "foreign scientists should either mind their own business or should address their protests to the Home Secretary" (etc). Nor do I believe that the main idea is to goad or shame scientists into taking the matter up with their own

government. I think I would have the intelligence to realise that any break in official relations (a) would not be intended to be a personal affront to me or my colleagues; (b) would naturally be brought to the attention of higher authority with neither goading nor shame attached.

The Soviet authorities could not ignore a number of similar ruptures in relations over a wide

spectrum from a variety of countries.

I personally think we should use all peaceful means at our disposal to express our absolute abhorrence of Russia's attitude on human rights.

CHRIS REID
Lecturer
Willesden College of
Technology
London

Three collections of historic hardware

WE would like to comment on the call by M. J. Cookson for a National Museum of Computers (Letters, June 29) and in particular on his assertion that "a single gallery in a major museum" (presumably meaning the Science Museum) is insufficient to be at all representative.

Our museums have the three major collections of historic computing hardware available to the general public in this country. Between us, we preserve a very wide range of

machines, and keep in close touch about items offered to us. We have all made strong links with the industry and with various small computing collections, eg in universities.

According to Mr Cookson, many historically significant pieces of hardware are being discarded, but he gave no reasons for this. We would offer two: either they had been offered to us and were refused as a "similar example" was already preserved in one or more of our collections, or more likely,

nobody had bothered to contact us or a local museum.

It is good to know that Mr Cookson is starting a small museum, and we hope that others will follow his example, so that computing displays will be available to inform and serve the community in all parts of the country.

For the historians and scholars, let us centralise the information rather than the machines. There is certainly a need for a comprehensive register of significant pieces of

computing hardware and archival material preserved around the country — held on a computer of course!

Who would like to co-operate who else is interested?

JANE RAIMES
Assistant Keeper,
Science Museum, London

ALLEN SIMPSON
Assistant Keeper,
Royal Scottish Museum,
Edinburgh

JIM ANDREW
Keeper, Museum of Science
and Industry, Birmingham.

OCR scanner is 11% faster — claim

YOUR headline "Siemens introduces a fast hand-held scanner" (CW, July 6) might be misunderstood as implying that the Siemens OCR scanner is much faster than others. Actually, the Toshiba OCR scanner is 11% faster than the Siemens one, at 10 characters to the inch spacing.

More important is the variation in speed of hand movement

that can be tolerated by hand-held OCR scanners. The figures are as follows:

Caers Corp OCRReader
76-330 mm/sec
30-130 char/sec

CompuScan Datawand
up to 381 mm/sec
up to 150 char/sec

KeyTronics RI100 series
up to 254 mm/sec
up to 100 char/sec

Recognition Equipment OCR Wand
76-330 mm/sec
30-130 char/sec

Siemens OCR Scanner
50-380 mm/sec
20-140 char/sec

Toshiba OCR Hand Scanner
70-400 mm/sec
22-176 char/sec

Incidentally, the error rates of these OCR scanners differ somewhat, and the prices differ greatly.

A. WRIGHT
Senior Research Officer
Aslib,
London SW1.

Cost of entering 32-bit business reduced

THE cost of getting into the 32-bit computer world has been dramatically reduced by the latest company to put eight of the devices together to make a processor in BTI Computer Systems of Sunnyvale, California.

BTI's new 32-bit system is the BTI 8000, a modular multi-processor system built around a high-speed 6711 microsecond bus which operates at up to 80 Megacycles per second (CW, June 29).

Designed for real-time time-sharing applications, the 8000 supports over 600 independent users, and up to eight CPUs can be plugged into the bus. The hardware is designed for efficient utilization of high-level languages, currently available languages with BTI are Fortran IV and Basic. Data is written by the user and stored in a disk file. BTI recommends the use of

There are no input/output instructions. Instead the CPU addresses the plug-in peripheral modules (bus access up to 18 resource modules), and options offered include up to eight processors, giving a theoretical maximum output capacity of 100 Megacycles; up to 32 input channels; 512 asynchronous terminal ports; and up to 128 channels of data with up to 255 Megacycles per second.

One of the principal aims was to design a system in which the user did not have to buy anything he did not need, and BTI says that the system is designed to accommodate reconfiguration. Thus if only processor goes down, the system continues to run, albeit with a delayed response time.

The operating system enables each user to run his own virtual machine, and BTI is working on the development which will allow any

type of terminal to be interfaced to the 8000. Mainstay of BTI's product line has hitherto been the BTI 4000, a time-sharing computer programmed in extended Basic and based on the Hewlett-Packard 21 MX minicomputer. Some 650 of these have been installed, and the BTI 8000 supports all software written in extended Basic for the 4000.

BTI started in 1968 as Basic Timesharing Inc., but in 1971 began developing time-sharing systems. It has an office in London, and plans to launch the 8000 on the European market in about nine months' time. The first 10 systems were sold to existing 4000 users in the US prior to formal launch.

Typical target markets are time-sharing bureaus and general OP users running batch systems who need to go on line to reduce their personnel costs. In the US, a basic 8000 system with one CPU, 256K bytes of memory, eight ports, a 32 Megabyte disc drive and a tape cartridge drive costs \$38,650.

Potential Data Control Staff

... should attend the Infotech Operations training course Data Control Techniques.

call John Blake for details: 0628 35031

Infotech Operations Ltd.

Nicholson House, Maidenhead, Berkshire, England.
Telephone Maidenhead (0628) 35031. Telex 847819.

Knight is right for contract staff

Knight Computer Services Ltd.,
14 Old Park Lane, London W1Y 4NL

Knight 01-491 4706

Staff Services Division of BOC Datasolve Group and
a member of Computing Services Association.

WILLIS

Willis Computer Supplies Ltd
PO Box 10 South Mole Road
Barnes, London W14 9JL
Tel: 0279 67621
Telex: 617425

SERVICES industry 17% growth

SALIS of computer services in the UK grew by 17% last year, with total turnover reaching \$6,900 million. This is revealed in ADAPS's annual report on the services industry, compiled by Ipat, the market research firm.

Of the three segments of the industry given, bureaux earned \$510 million, software licences \$972 million, and consultancies \$972 million. Banking and manufacturing were the industry's major customers, banking providing 17% of total revenues and manufacturing 21%.

The study also looked at the impact of minis and microcomputers on the services industry. It concluded that about 25% of existing services business, largely at bureaux, is vulnerable to replacement by in-house minis. However, the larger bureaux expect to gain business by installing minis and micros at their customers' premises. About 7,000 such installations are expected by 1979.

The report is available for sale by ADAPS at \$495 a copy.

A young visitor has her fortune told by an MDS Series 21 Model 40 system at Riga's Old English Fayre last week. The Series 21, operated by "Gipsy" Pat Gilt of MDS, was installed in the showhouse run on behalf of Riga's Normal Table.

GEC pre-tax profits up 16%

PRE-TAX profits at GEC rose 16% to £325 million in the year to March 1978 on turnover up 14% to £2,343 million. The company did £608 million of business overseas, representing 26% of the total. The largest single sector is the one that groups

together electronics, automation and telecommunications, which produced turnover of £672 million in the UK. GEC now has £417 million in net cash, but as this is in the UK it would probably have to arrange a loan for acquisitions in the US.

'Up to 20,000 Series 1 minis a year by 1981'

BY 1981, IBM's Series 1 minicomputer is predicted to bring the company annual business of \$16 million, and to represent one-fifth of the total business then done by the General Systems Division, GSD. By comparison, the world minicomputer market stood at \$2,300 million in total in 1977. The forecasts contained in a report on the Series 1 from International Data Corp, IDC.

IDC also predicts that 10M will be shipping over 10,000 Series 1 minis a year by 1980, and will be up to 20,000 a year by 1981, and contrasts this with minicomputer market leader Digital Equipment Corp.

According to IDC, DEC shipped 19,500 minis in 1976, after it had been in the business 11 years.

It also forecasts that IBM's share of the world minicomputer market will grow from 3% last year to 15% by 1981, but adds a word of cheer for the traditional minimakers: only 20% of the business will be at the expense of other manufacturers; the remainder will be from new markets developed by IBM.

A \$500 million market for independent suppliers making peripherals for Series 1 is forecast by 1980.

The report, apparently unedited, runs to 20 pages, and costs \$15 from IDC, 214 Third Avenue, Waltham, Massachusetts, MA 02154, US.

Search is on for the UK's 'export expert'

A COMPETITION to find Britain's "Export Expert" is to be held by the Institute of Export, in conjunction with other organisations, the CBI and the TUC.

Men and women working in or studying for the export business will be asked a wide range of questions on matters relating to exporting, and the winner will receive a prize of £500.

This is a repeat of last year's "Export Your Expert" competition, and is intended to demonstrate the wide range of knowledge needed to compete in tough international markets: salesmen-

ship is no longer enough. Contestants will be quizzed on documentation, insurance, transportation, finance, etc., as well as general knowledge.

Each winner of the five regional honours of the competition will receive £100 and go on to the national final. Last year's winner, Brian Moran of Rexel, will be defending his title.

Those interested in competing should contact James Robinson at the Institute of Export, World Trade Centre, London E1. Tel: 01-488 4768.

Analysis of European electronics manufacturers

FINANCIAL details of the 50 biggest electronics manufacturers operating in Europe are provided in a yearbook now available from Mackintosh Publications Ltd. The companies listed sell all kinds of electronic equipment, including computer systems, text processors and electronic calculators and cash registers. The other product areas include communications equipment, consumer electronics and components.

For each company the yearbook lists its sales by product, by area and by subsidiary companies, where they exist. Profit and asset figures are also provided and in most cases figures are presented for each year going back for up to 10 years. In each case the latest figures relate to 1978.

The biggest electronic supplier in Europe in 1978 was IBM, with sales worth more than \$7,400 million, while Philips followed fairly closely with \$6,500 million, although computer equipment accounted for only a small percentage of this.

Of the total sales of electronic equipment in Europe in 1978 of \$50,000 million, US based firms accounted for \$16,000 million, West German based companies for more than \$9,000 million, and UK and French firms for about \$5,000 million each.

Mackintosh Yearbook of European Electronics Companies 1978, £18, 100pp, Mackintosh Publications Ltd, Mackintosh House, Napier Road, Luton, England, LU1 1RG. Tel: Luton (0582) 417438.

Real time net from CEEB

From Front Page

being a compilation phase. The intermediate code would then be interpreted at execution time, as in CAP's Micro-Cobol system.

This approach, which the CEEB describes as "deferred processing", offers the benefit of an intermediate soft machine. The interface will be used to support a high level interactive testing package which will allow symbolic debugging.

Compas will be written in Corol06 in the dialect defined by Systems Designers. Capable of running on all hardware supporting the language, the system will not, however, operate on machines with a word length of less than 16 bits.

In addition to a language processor, the software will include an existing real time executive called Topsy, I/O and file handling routines, support utilities, and facilities for communications network management.

The software will be capable of operating on any type of linked network structure and is also likely to be available in a stripped down form for use on a single processor.

NEWS IN BRIEF

Little to fear - police chief

THE public have little to fear from the use of computers by the British police, according to Sir David McNae, Commissioner of the Metropolitan Police. But, he told a CISA lunch, clear and adequate safeguards are needed against the misuse of computerised information.

However, if general access were allowed to police records, it would greatly inhibit police work, he said, adding that he thought most people "are very concerned" about being able to inspect records.

Anti-trust limits

A US government commission studying ways in which anti-trust cases such as the nine-year-old case against IBM can be speeded up, has been advised to recommend that strict limits be set on the pre-trial period of assembly of evidence, with penalties for lawyers who use dilatory tactics or file frivolous motions.

Zilog launch

A MICROCOMPUTER system that can be used as either an intelligent terminal or a general computer system has been introduced by Zilog. Known as the MCZ 1700, it is based on a dual Z80 microcomputer board configuration.

Certificate record

A RECORD number of students, 800, have gained the National Computing Centre's Basic Certificate in Systems Analysis Design this year. Of these, 400 were overseas.

EEO directive

COMPUTERS are free from trade directives until 1981, a recent report a printers' union added six years on to the particular deadline.

MICRO NEWS

'Bleak future' for micro applications

AT the same time that two of the three working parties set up by the Advisory Council for Applied Research and Development to look into the impact of the microprocessor on British industry, have completed their reports, a chilling indictment of the industry's capability to use the device has come from Sussex University's Science Policy Research Unit.

In a report called "The Impact of microelectronics in the UK: A suggested classification and illustrative case studies", the SPU points to a potentially bleak future.

The Sussex report refers to what it calls a "dynamic failure mode" in those areas of British industry that are already under the threat of foreign imports that either use microprocessors, or employ them in the manufacturing process. The dynamic failure mode is one in which only the successful companies can afford the high costs involved in developing new products and production processes. The less successful companies are left to become progressively less successful.

The report also highlights the underlying theme behind the Department of Industry's efforts to generate a strong UK microelectronics industry, and the National Economic Development Office's insistence that support for it should cover potential standard products, as well as specials.

It states that even where firms do respond to the challenge presented by the microprocessor and microelectronics, the overall economic prospects could still be bleak. In the absence of

an established British microelectronics industry, the firms will have to import many of their components, the report states, suggesting that the balance of payments in new technology is likely to be severely negative.

Only one area of industrial activity, office products manufacture, comes through relatively unscathed from the four main sectors that are examined in the report. Yet even here, in an area where microelectronic technology is rapidly being exploited, the counter-argument of the adverse effect on employment prospects is raised.

The report tends to underline the importance of the studies just completed by the ACARD working parties.

Now operating under the auspices of the government's Central Policy Review Staff, the "think tank," their reports will form the basis of future government policy towards the micro and its implementation.

The two completed reports cover the immediate aspects of the impact of solid state technology on industry, and the ways in which new companies can be established to exploit the new technology more easily.

The former has helped formulate the policy taken by the Department of Industry in its announced support for micro applications (CW, July 8).

The DoI suggested that only 50% of UK industry knew about micros, and only 2% of that figure were actually doing anything about it. The report is certain to call for support along the lines set out by the DoI, but

probably at greatly increased levels.

The importance of the second report is of greater potential, for the expertise to develop microprocessor applications economically is probably available in the UK. If the right circumstances can be established to promote and exploit it.

These two reports will now be studied by the full Council and government ministers, together with the third working party of the ACARD trio. This has the task of examining the long term social and economic implications of the growth of microelectronics exploitation.

It seems certain that it will take the view that UK industry must make the opportunities presented by the micro, for the threat to industry from more advanced competitors will be there anyway.

Bywood gives details of Scrumpi 4 kit

MORE details have come from Bywood concerning its soon to be announced Scrumpi 4 microcomputer kit, first mentioned publicly by the company at the Doit-Yourself Computer Show.

As indicated, the system should be one of the first kits available that makes use of a large capacity ROM to hold the Basic Interpreter software. This is a 32K bit device from National Semiconductor that is masked with the company's NIBL, National Industrial Basic Language. This is a 4K byte tiny Basic that requires a minimum of 1K byte of addressable memory for operation.

Like the other Scrumpi kits, number 4 is based on the National Semiconductor SC/MP-2 microprocessor, and in minimum configuration will be equipped with the 1K byte of RAM required by the software.

It will, however, be soaked to accommodate up to 14 devices of the 2114 type, giving a total capacity of 8K bytes of RAM, plus an additional eight sockets for either 2708/2716 type ROM/PROM devices, or RAMs with similar pin out configurations, which takes the total RAM capacity up to 16K bytes.

Additional sockets for further ROMs are also included. In particular, there is a socket for the new National Semiconductor 64K bit ROM announced earlier this year and due to be available before the year is out.

The division now offers subcontract systems development services that is currently based on the micros that the distributor company has franchised to sell.

The immediate basis for the division's growth predictions stem from a £200,000 contract received from an Australian company; plus the possibility of a large Ministry of Defence order for a data logging system.

Although currently geared to work with the devices its parent company sells, and with some £50,000 worth of suitable development systems already installed, the division is now planning to expand its operations beyond these franchised products. It is currently looking at both the Tektronix and Eutradata development systems.

Service company for kits

THE growth in the number of microcomputer kits has prompted the formation of a new company, Video Terminals, that intends in service the market's need for power supplies and video monitors.

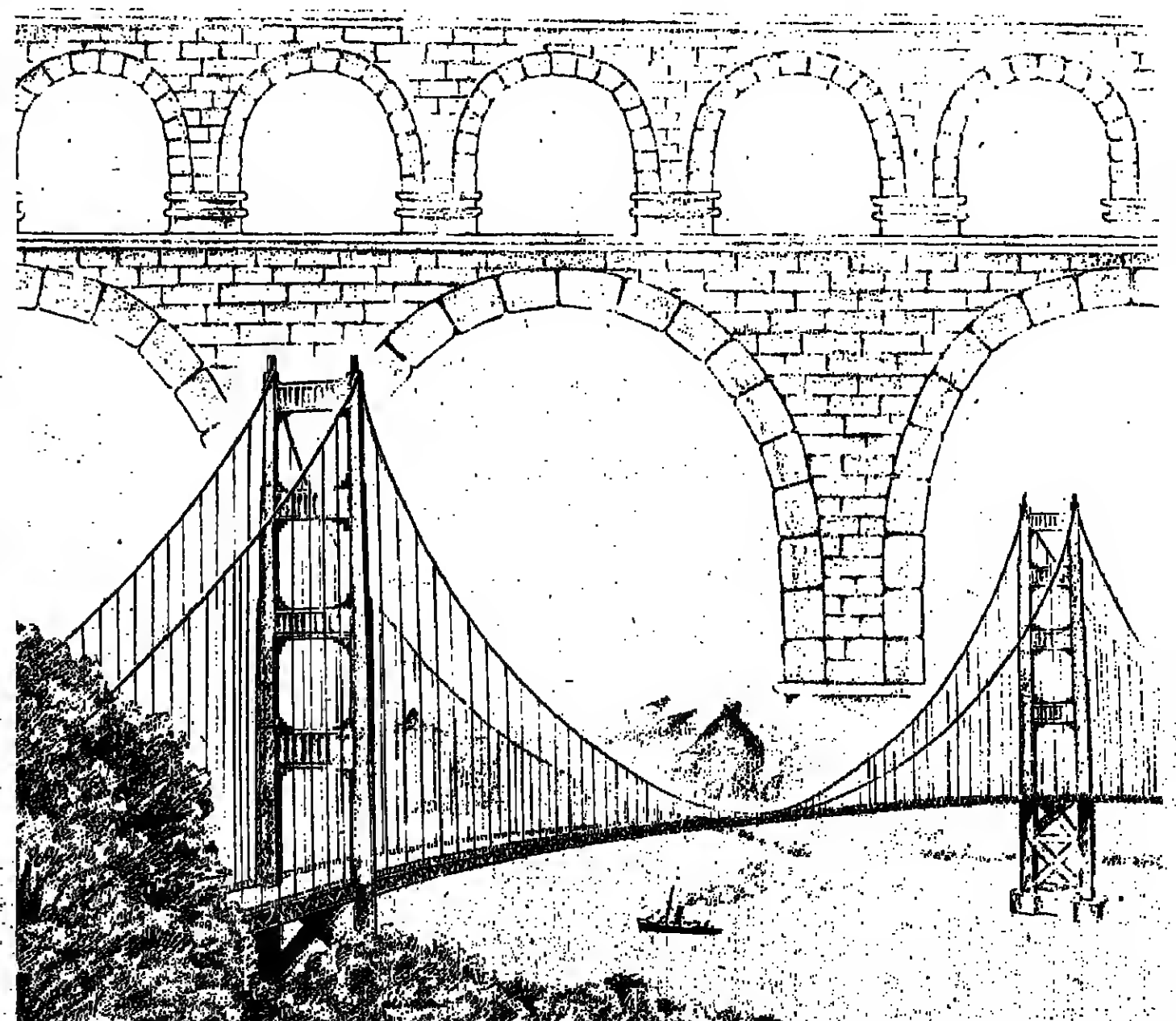
Based at 197, Hornbeams, Hurlow, Essex, the company's first product is a combined power supply and video monitor that will be available in either kit form, or pre-assembled. Although aimed initially at the large number of Nascom 1 users, the kit will operate with most systems currently available.

Two versions of the system will be produced, each of which will have a nine-inch display tube. One supplies 1.2 amps at 5 volts, the other 4 amps at 5 volts.

In kit form, the former will cost £168 and £185 pre-assembled, while the latter will be priced at £178 in kit form, and £193 pre-assembled.



The recent computer Othello competition which was sponsored by consultants Zous Hormon and Computer Weekly brought out a variety of systems, and our picture shows Zous Hormon managing director, Mick Punter, playing one of the smallest. This is the version being sold by Mine of Information of St Albans to run on the Nascom 1 microcomputer kit. Available in cassette form, with documentation, for an all-inclusive price of £2, the package provides a full 8 by 8 matrix display. White pieces are represented by an open square, while black pieces are shown as hatched squares. A comma indicates an empty square into which it is possible to move. The program automatically detects the end of the game, but leaves the two players to count their own pieces to see who has won.



Success breeds success

First, our credibility. Our pedigree is first class. We've got proven hardware and software and a blue-chip user list. We've earned a reputation second to none in demanding areas such as science, research and industry. Many hundreds of our systems are in daily use throughout Europe. We are, in anybody's terms, a successful company.

Now the message. Our tried and tested multi-access software has recently been extended to include functions which enable users to additionally specify GEC computer systems for commercial and business computing. So now a wider range of users may enjoy the same benefits.

Finally, the argument. Our experience in the demanding world of automation, information handling, communications and science is just as relevant to the world of commerce. The hardware components are the same. A substantial chunk of the software is the same. And we can show that meeting our customers' varied and exacting demands is something we take in our stride.

So you can now call us for commercial computing as well. Our UK Sales Manager is on 01-953 2030 ext. 3799, and our Export Office is ext. 3478.

GEC

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Or other memories in the wide Plessey range - 8K, 16K and 32K plug-in compatible.

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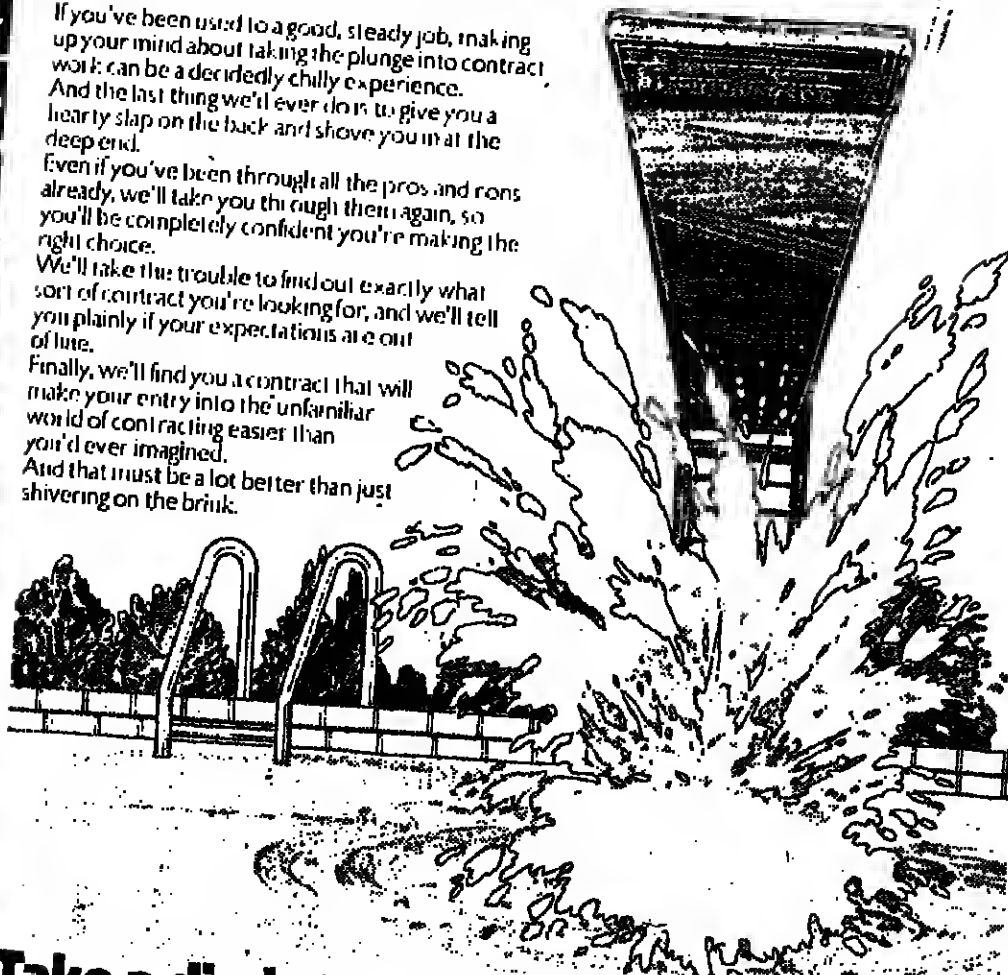
Contract work: you'll enjoy it once you're in.

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Please contact Richard Kaluzynski or Sue Gilliam on: 01-491 4706 or 01-439 3411.

All vacancies are open to both male and female applicants.

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Staff Services Division of DCC Datasolve Group and
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One of the joys of working for Pullman Kellogg is that they are sharing their success. Success means expansion and expansion means opportunity. It's as simple as that. Now, their busy Computer Services Department in Wembley are looking for a Production Controller to set up computer runs and printouts and generally smooth out the gremlins in the D.P. Department.

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LONDON BOROUGHS OF BRENT AND EALING HELP US launch a new project!

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Salary £2548 to £3887 p.a. inclusive, plus car allowance up to £210 p.a. and mileage up to 10.5p per mile.

We are just over 100,000 370/145 computer installation. The Computer Division is expanding into telecommunications and a property computer audit. In an advisory and supervisory capacity to the Audit Division of both Brent and Ealing. The scope of the post will be to audit the control of all systems, interdependencies and use of test hardware and software, prevention of possible error, security of security of information.

Applicants should be senior systems analysts with experience of British Computer Society or equivalentally qualified. Every opportunity will be afforded to fulfil the postholder's ongoing training needs. Working hours may be introduced. Substantial staff contingent at Brent and Ealing.

Application forms and job descriptions from the Administration Manager, Room 708, Brent House, High Road, Wembley, Middlesex, will be available from 2nd August, 1978. Telephone: 01-903 8271 (24-hour answering service). Reference number: P/4910 must be quoted.

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contract opportunities for experienced programmers

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Programmers
Urgently required for Fortran and Scientific Computing. 13,000 £5,000. All areas. Telephone for free info. VACANCY

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For an application form and further details, write to GARRICK PRASER, Personnel Officer, Honeywell I.S. Limited, Honeywell House, Great West Road, Brentford, Middlesex, TW8 9DH.

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CLIP AND SEND TO GARRICK PRASER, Personnel Officer, Honeywell I.S. Limited, Honeywell House, Great West Road, Brentford, Middlesex TW8 9DH. Please send me further details and an application form.

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Area of experience _____

Tel. No. _____

Honeywell

Honeywell, one of the most successful computer companies in the world has, as part of its internal restructuring and growth process, created an important new area of computer operation to handle the marketing of Level 62 and 64 Systems. This is the General Systems Division.

The new Division is a major one and now needs the sort of specialist knowledge you can provide, if you are a Systems Analyst or Analyst/Programmer with experience in any of the areas listed on the right.

The career rewards for you will be high and immediate, if you are a professional with specialist knowledge in one of these areas. The General Systems Division and its customers needs you. If you are talented and ambitious, with a well-developed instinct for innovative computer application in your speciality, we are out to get you.

Wherever you are in the U.K., if you have the applications experience we are looking for, you must investigate this opportunity within an exciting new Division of one of the world leaders in computers.

As a Systems Support Consultant with Honeywell, applying your expertise to customer problems, you will find that the knowledge you have gained by following your present course, whether in finance and its allied fields, distribution, manufacturing, or any of the others listed, is more important and valuable to you than you had realised.

We're after the top Systems people. Salary will be at the top end of what the industry has to offer, as are our benefits, which include assistance with relocation expenses and a company car or car allowance where appropriate.

If you believe you have the sort of experience we're looking for CONTACT US NOW.

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Nr. 1 bridge c.£6,500 (Central London c.£7,000)
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Surrey c.£6,500 - £7,000 (Switzerland c.£15,000+)
Holland c.£11,500+ package

The above locations indicate a selection of our clients with current vacancies for either potential or experienced writers; the salaries stated are definitely on offer for candidates who meet the requirement. In some cases the client concerned is in the process of setting up technical publications team. In most cases either complete or very generous relocation expenses can be negotiated. We welcome calls from anyone now engaged in documentation or interested in making a career change into this creative, interesting and financially rewarding work. We have many other clients in other UK locations and overseas.

Marketing Support Analysts

West London up to £7,000 + car
This company are seeking self-motivated analysts, ideally from a communications systems environment, who would like to apply their talents to marketing in a first class product and offer pre/post sales support. Applicants will be readily considered who have a fairly broad knowledge of the d.p. industry, particularly the terminal systems market, some background in technical programming and analysis is a definite bonus. The company will offer a generous salary commensurate with experience, a private company car (including private mileage) and a definite career path.

Programmer/Analysts

London up to £7,000
Our client is an international company setting-up a distributed-processing system from scratch. They have tremendous resources and are prepared to pay up-market rates for the expertise needed - it will, however, be a fairly small but highly industrious team, which indicates the kind of autonomous responsibility you could be seeking. Applicants should have at least 2 years solid experience of programming with recent additional involvement in analysis. Particularly attractive will be teleprocessing, commercial, or transaction processing experience on minicomputer systems.

Really unparalleled opportunity for people in state of run-of-the-mill jobs to break into a dynamic forward moving environment. Contact: Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

Analyst/Programmer

Libya c.£12,000
This client has built up an enviable reputation in the oil business, providing commercial and information services all over the world. One of their overseas projects is based in Tripoli, using an IBM 370/155 under DOS, with COBOL as the main programming language. They require an experienced analyst/programmer who will act as deputy to the Project Leader in Tripoli, with the possibility of taking over the job within a year.

COBOL Programmers

Surrey Start to £6,900 + BUPA
Specialising in the provision of conversion services to installations changing or upgrading their hardware, this company requires good COBOL programmers to help them stay on top of the most up-to-date computer technology. Their Richmond headquarters service both Europe and UK, so after initial training you could find yourself spending short periods abroad - supported by generous Tax-Free Allowances on top of your salary. If you enjoy programming, would welcome the chance of travel and variety, and relief the idea of keeping constantly in touch with modern equipment and ideas, you may fit into this challenging and exciting environment. First class training and promotion opportunities, relocation expenses and free life and health insurance are some of the substantial benefits available with this company.

Sales Executives

All Areas
The incredible shortage of good, ambitious salesmen in D.P. is well known and like everyone else in the recruitment business we have several clients with vacancies for all kinds of sales skills. If you have a good track record with your present company, but perhaps feel that you are getting a little stale, why not register your requirements with JBA. We choose our clients with care and will not offer you either the type of job for which you are patently unsuitable nor the kind for which you have specifically requested not to be considered. We have, for instance, small but rapidly growing firms who need to increase a small sales force in order to continue their growth and with whom you can make a significant contribution whilst ensuring rapid advancement in insouciance levels.

Contact: Andy Wright

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to join a team engaged in commercial systems and based in Harlow, Essex

Equipment currently in use includes:
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Languages used:
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The Company offers:
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SYSTEMS ANALYSTS ON-LINE REAL-TIME DEVELOPMENT

MIDDLESEX

c £6750

We are seeking experienced Analysts or Analyst/Programmers keen to enhance their career by developing several advanced on-line and real-time applications using the latest DEC and IBM hardware.

Applicants should have a minimum of three years' commercial systems experience, gained in an installation with high standards of analysis, design and documentation. Technical training in the systems software to be used will be given to successful applicants.

The Company offer a salary package c £6750 with excellent conditions of employment including subsidised canteen, pension scheme, generous car purchase facilities and flexitime.

Ref: W2/2007

24-hr. answering service
Please telephone for a confidential discussion or write to:
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SYSTEMS PROGRAMMER

LONDON, WC2 c. £6,500

4/5 years' experience of IBM DOS/VS with a sound knowledge of IBM COBOL. Good prospects of promotion to Chief Programmer.

SENIOR PROGRAMMER c. £6,000

SLough

Have you 3/5 years' COBOL, preferable IBM with some ASSEMBLER AND CICS? Could you control 2-3 programmers? Yes, then this vacancy is for you.

PROGRAMMERS LONDON, SW1 To £5,000

All levels with experience of ASSEMBLER and/or BASIC on commercial mini-computer systems.

PL1 PROGRAMMERS £3,500-£5,500

HAMPSHIRE

Applicants should have at least 18 months' experience with PL1 in the main language. Training in COBOL or ASSEMBLER programming considered.

PROGRAMMER To £4,500

CHESHIRE

To be involved in the development and maintenance of programs on the ICL system 10. Experience of ASSEMBLER II preferable. Able to work closely with management and head office.

For further details and an application form please phone or call in.

AMES PERSONNEL

Employment Agency Suite 14, Dryden Chambers, 119 Oxford Street, London, W1R 1PA Tel: 01-434 1106

Programmer

London N.1. Salary around £4,500

BSI require a Programmer with COBOL/BASIC

experience to join our Computer Services team at King's Cross. Current equipment comprises a PDP 11/45 with 80M byte storage, 192K byte core and 24 peripherals. The system is mainly on line but there is some batch processing.

Terms of service include five weeks' annual holiday, an excellent contributory pension scheme, LVs and a subsidised canteen.

If you are interested and prepared to work shifts please phone:-

David Bennett
Personnel Officer
01-337 8801

British Standards Institution



Data Processing Recruitment Consultants

Another Creative Alternative Netherlands

Salaries: £10K - 16K + Real Benefits.

The cutting-edge of Mini Computer technology is an exciting place to be if you have the skill and ambition to match the all-too-exclusive inner circle of top-flight professionals who provide innovative solutions to demanding problems. Our client built their enviable success on just such people and their ideas by successfully creating an environment in which creative people become highly involved with ideas, with each other and with their work. A further phase of planned expansion of the Dutch based operation necessitates recruitment of Consultants, Analysts, Analyst/Programmers and Programmers with sound Mini computer backgrounds.

Those involved with programming must be strong in the use of Assembler. Areas of particular interest are: Message and Packet switching, Networking, Real-Time applications, software and communications. Our client will give candidates and their families every assistance in relocating, including paid removal expenses and accommodation costs pending location of permanent housing. Also a generous resettlement advance will be granted where necessary. You'll appreciate what we mean by 'Creative Alternative' when you see our clients and measure their achievement.

Ref: 171A

NCR Analyst Programmer Cairo + Kuwait

Salaries: c.15K (tax free) + Housing.

Our client is perhaps the most significant European Systems and Hardware Specialist group within the E.E.C. and is currently undertaking two similar Banking computerisation programmes - one in Cairo and the other in Kuwait. Successful candidates are likely to have sound NCR Criterion experience and hopefully a financial background. COBOL expertise is naturally a prerequisite. The ideal age bracket is 25-35 and single

status would be advantageous but not essential as some married accommodation is available. In addition to a very high tax-free salary our client provides exceptional furnished accommodation and generous fringe benefits. After an initial 1 year tour of duty they offer the option to transfer within the group to Scandinavia or other Middle-East locations.

Ref: 171B

Systems Designers + Programmers etc. Cheshire

Salaries: £6 - 9.5K (a.a.e.)

A very prestige client with headquarters in London and regional offices located in Cheshire and throughout Europe urgently requires the following: Real-time and on-line Programmers, System and Data base designers and compiler specialists with 2/5 years experience. Of particular interest would be people with relevant experience in one or more of the following: Ferranti DEC with Basic, RTL II or Coral and IBM or ICL with Assembler, PL/I or COBOL. Also IMS

or similar and Data Base design. The scope of projects is both broad and demanding and certainly in keeping with the prestige of this client. You will play an important role in project development and the opportunity to enhance your technical expertise is one of the attributes of working with this reputable group. Fringe benefits are well above average and full relocation expenses will of course be met.

Ref: 171C

Event - Driven Technology Central London

Salary to 10K

This U.S. based manufacturer requires Project Managers, Leading Analysts and Consultant Programmers to participate in its increasing success. It has supplied large, mid and mini systems to the U.K. private sector of industry for 20 years and now additionally ranks as a major and increasing force in the supply of hardware and software to Public Corporations, National Institutions and Research Establishments.

Don't worry over your specific mainframe or mini-computer experience since motivation, versatility and a well rounded personality are much more important. A Banking, Insurance or Time-Sharing background would be especially welcome though. Naturally those who have long term aspirations to work and settle in U.S.A. will be catered for but in the first instance your role will be a mobile one within London and its environs.

Ref: 171D

Analysts + Cobol, Bal Programmers South of Thames

Salaries: c. £5.7K to £8K + outstanding benefits

One of the largest and most diverse U.K. Insurance Companies is seeking both Systems Analysts and Programmers for its new, Installation South of the Thames. SYSTEMS ANALYSTS: Candidates should preferably have progressed from a COBOL or mainframe Assembler programming background into systems development. It is an essential requirement that all applicants should have been extensively involved in at least one large banking, stock-broking or insurance type project.

PROGRAMMERS: Candidates must have a minimum of one years COBOL and/or ASSEMBLER programming experience. In-house and manufacturer training courses will be heavily relied upon to supplement and enhance successful candidates career prospects. FRINGE BENEFITS: Low cost mortgage (after an initial qualifying period of 6 months), full relocation expenses, 2% contributory pension scheme, discounted life insurance and motor vehicle insurance premiums and (when applicable) paid overtime.

Ref: 171E

Logistix, Freepost 32, London W1E 3YZ
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Tel. Home _____ Office (discretion will be used) _____

Age _____ Place of Birth _____ Car? _____

Are you prepared to relocate? _____ UK/Abroad (delete)

Experience Place no. of yrs. in box, e.g. IBM 360/370... 4

Machines: Please specify model. Applications

IBM 360/370... Commercial... Financial...

IBM others (specify)... Payroll...

ICL 1900/2900... Production control...

ICL others (specify)... Stock control...

Honeywell... Scientific...

Univac... Realtime...

Burroughs... Software...

PDP... Database...

Other mainframes (specify)... Message switching...

(specify)... Communications...

Other mini-computers... Data transmission...

(specify)... Central process...

Languages... Teleprocessing...

Cobol... MIS/CPA/PERT...

Plan... Magnetic tape...

Assembler... Disk...

PL/I... Others (specify)...

Fortran... Job Titles...

Filetab... Project leader...

RPG11... Systems analyst...

Auto/easy/user code... Systems engineer...

Others (specify)... Analyst/programmer...

Operating Systems... Systems programmer...

DOS... Programmer...

OS... Operations supervisor...

Geos (specify)... Operator...

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*Delete where inapplicable.

Position sought Please state briefly the type of appointment you are seeking.

Minimum salary £ _____ Notice required/Date available _____

Signed _____ Date _____

Cut out the whole advertisement and post to the address below.



Knight Computer Services Limited

Staff Services Division of BOC Data Services Group and a member of Computing Services Association

Knight Computer Services Limited, 14 Old Park Lane, London W1Y 4NL

01-491 4706

24-hour answer phone

01-491 4706

RPG II PROGRAMMERS

London (All Areas)

£4000-£6500+

We have a varied selection of vacancies in all areas of London covering a wide range of programming experience. These positions cover a broad spectrum of the Computer Industry, ranging from large well established Software Consultancies and manufacturing companies to small retailing and publishing concerns. The equipment in use includes all the IBM SYSTEM 3 series and ICL 1900 and 2900 mainframes.

All the companies offer attractive starting salaries, and fringe benefits vary from Free Lunches and Season Ticket Loans to Travelling Expenses and Annual Bonuses.

Reference JC29/1

PL1 PROGRAMMERS

City

£6000

One of Europe's foremost companies and a market leader in the Transport and Distribution industry is in the process of expanding its 370 installation and upgrading the Operating System from DOS/V5 to OS/MVS.

In order to ensure that the transition is as smooth as possible they wish to recruit talented programmers with at least one year's PL1 experience. A commercial background with Database or Real Time applications would be advantageous as would a knowledge of OS/MVS.

A first class salary is coupled with excellent career prospects and fringe benefits. Reference JC29/2

COBOL PROGRAMMERS

West London

£6500

A major manufacturing organisation wishes to recruit additional staff to assist in the implementation of new projects at their West London Computer Centre. They are interested in programmers with all levels of experience to work on a number of new systems which are in various stages of development. All programs are written in COBOL and experience on any major manufacturer's hardware will be considered, as specialist training will be given where necessary to successful candidates.

The company, which has diverse interests throughout industry, offers excellent conditions of employment including free lunches and Life Assurance and the opportunity to develop beyond programming into Analysis and Systems work.

Reference JC29/3

SYSTEMS ANALYST

City

£6500

Our client, a leading light in the leisure industry with a high stake in the Sport of Kings, is seeking ambitious young analysts to join a team involved in the expansion of their existing System and the development of new commercial projects.

The people they want are go-ahead individuals with an eye to the future who wish to fully utilise their talents and add to their experience and expertise. They will have a programming background, preferably using COBOL, and a minimum of two years Analysts experience.

In addition to a competitive starting salary the company offers an attractive benefits package and excellent working conditions.

Reference JC29/4

PDP 11 PROGRAMMERS

London & Home Counties

up to £7500

We are currently looking for a number of experienced PDP 11 programmers to work for both users and software houses.

You should have at least 18 months experience using Basic+, Macro Assembler or Fortran, in applications such as Engineering, Graphics, Operations Research, Technical Support or Financial Systems.

At present we have an unusually large selection of opportunities registered, so if you feel you fulfil any of the above conditions and would like to improve your salary and prospects, contact us today.

Reference PG29/5

FORTRAN PROGRAMMERS

West End

£4500-£5500+

The data processing division of a long established civil engineering giant is seeking young and capable programmers to work on their growing range of projects. Applications vary from management information packages to financial and technical modelling on the one hand, and from engineering consultancy to bureau services on the other.

A minimum of 12 months' experience is desirable and, due to the diverse nature of their applications, a background on any mainframe or mini machine will be acceptable.

Opportunities to progress into Systems Analysis or new technical areas are available, and there is the added bonus of occasional overseas travel as well.

Reference PG29/6

Unlimited territory for a very rare species

Database Specialists to £10,000 plus car

A leading company needed a nationwide computer system — to be developed from scratch to handle its entire sales, service, spare parts and accounting functions. Perhaps a network of ten dispersed minicomputers would provide the most economic solution. Perhaps more than twenty. Could you evaluate a requirement like that? Or design the distributed database?

One of the country's fastest growing insurance companies required an online database system to cover all aspects of its business. Could you design a highly complex database containing 1500 Mbytes of data? Or solve the recovery problems inherent in online access to such data volumes? Could you design the transaction processing monitor? Or

estimate the response time under widely differing loads?

Data Logic is looking for consultants and system designers for these and similar projects. Current assignments include work for banking, manufacturing and distribution, and public sector organisations. Technically, the scope of work should give unlimited opportunities to the right people.

The experience and personal qualities we need are extremely rare. Preferably, candidates will have a degree in computing science or a relevant discipline. They will have spent at least five years on the design and implementation of database management systems — on minis or mainframes. Ideally this will have been with a computer manufacturer.

or a software product company, although work with a software house or a major user of an online database system will also be of interest. Candidates will have the ability to work with a minimum of supervision and to deal effectively with senior management in client companies. Detailed knowledge of one of the following will be a distinct advantage: IMS/DL1, TOTAL, DMS2, IDMS, IDS, ADABAS.

Data Logic

We know we are asking a great deal. In return we offer a salary of up to £10,000 p.a., a share in the profits of the country's most profitable software company, contributory pension scheme and a company car.

Why not call or write to arrange an informal meeting? We would like the opportunity to describe the challenges and rewards of working for Data Logic. And you'd probably like it confirmed that you are as rare as you think.

If you are some of the way to meeting our requirements, we would also like to hear from you. Prospects could be equally exciting and a Data Logic progression to the highest positions comes quicker than practically anywhere else.

Call or write: W. D. Barrow, Data Logic Limited, FREEMOST, Westway House, 320 Quisp Road East, Greenford, Middlesex UB6 8BR.

Telephone 01-578 9111

REAL-TIME SYSTEMS DESIGNERS

£6K-£8400

You should have at least 2 years' experience of designing and implementing real-time or on-line systems preferably using DEC equipment.

The Software knowledge required would encompass programming experience in Assembly level, Fortran Corel or RTL 2.

The company is one of Britain's top five Software Consultancies with a very broad client base which can include Overseas opportunities. Initially you will be based in London but mobility is obviously an essential prerequisite of the position.

Please ring Doug Woodward, ref. 1418, tel. 01-235 3215.

WHERE QUALITY IS PAID FOR

Our clients' philosophy is based on producing quality Computer Professionals who take pride in their daily tasks. When there are so many installations lacking in training facilities and career planning how refreshing it is to meet a large organisation prepared to spend time and money on You.

PROGRAMMERS and PROGRAMMER ANALYSTS with PL/1 background are required for their very sophisticated IBM set-up. The very latest Software and communications techniques are available to assist you in your thirst for knowledge. Opportunities exist to move into Management, Software, Systems and other departments should your career point in that direction. The company is well aware of the need for a financial response to quality work and there are many other benefits in addition to the salary. Relocation assistance is offered where necessary.

You don't have to work in London to gain all these advantages.

BERKS/MIDD. Salaries to £7300

Please ring Doug Woodward, ref. 1405, tel. 01-235 3215

BE A 2-SHIFT SHIFT LEADER

In East London on IBM DOS installation a shift leader with 4 years' experience under DOS to lead a medium sized team. Salaries range to £4750. Please ring Glenn Donnelly, ref. 1053, tel. 01-235 3215.

**SHIFT LEADERS RELOCATE TO THE SOUTH COAST**

3-4 years' experience on Medium range IBM 370 required with knowledge of OS/VS 1.

You should have the ability to progress into Management, and preferably aged 25-32.

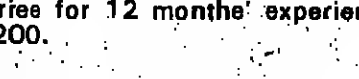
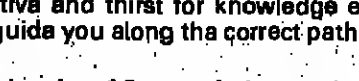
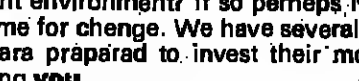
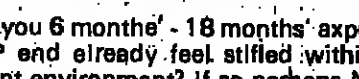
Generous relocation expenses will be paid and in addition to a salary of £5K there are other lucrative benefits.

Please ring Glenn Donnelly, ref. 1386, tel. 01-235 3215.

**PROFESSIONAL CONTRACT OPERATORS**

We have numerous posts available for Contract Operators and shift leaders. We pay excellent rates promptly and give a first class service to both our clients and our contractors.

Please ring Glenn Donnelly, tel. 01-235 3215.

**ARE YOU TELLING YOUR CUSTOMERS WHERE TO GO?**

Which direction at the very least, whilst working for this international corporation you will be expected to give directional advice and practical involvement for their customers whether they are multi-million £ companies or smaller, more cost conscious users with important computerised problems to be solved.

You will be able to show real experience in at least 2 of the following:

- * Business Consultancy
- * Data Base Techniques
- * Project Management
- * DP Management
- * Commercial Systems Design
- * Communications Design

As a Consultant you will have a professional approach to match that of this Software Service Corporation. You will preferably be mobile, able to stimulate and motivate others and have skills of communication.

SALARIES RANGE FROM £6800-£8800 with other financial benefits. LONDON AREA.

Please ring Doug Woodward, ref. 1406, tel. 01-235 3215.

CAREER-MINDED PROGRAMMERS SAL. TO £6050. HERTS/ESSEX BORDER

Programmers with an ICL background are required to join a very professional International Corporation situated on the border of Herts and Essex.

They are searching for a Programmer and a Senior Programmer with 18 months' and 3 years' experience respectively, to work on a wide and challenging range of applications development. You will have some experience of either COBOL or PLAN preferably gained in a George 2 environment, any knowledge, or exposure to DATADrive or similar package would be advantageous.

Training is given as a priority and this provides the opportunity to gain tremendous expertise whilst working within a friendly team structure.

Please ring Doug Woodward, ref. 1163, tel. 01-235 3215.

SUPERIOR SENIOR OPERATORS £4800 HERTS

We are looking for 2x Senior Operators of exceptional quality for our clients based in Hertfordshire. You will have at least two years' IBM/OS/VS 1 experience and be capable of coping with all day-to-day functions. With an eye to the future, this TWO SHIFT installation can offer you all the opportunities you are seeking.

Please ring Glenn Donnelly, ref. 1347, tel. 01-235 3215.

JUNIOR PROGRAMMERS LONDON AREA

Have you 6 months' - 18 months' experience in DP and already feel stifled within your present environment? If so perhaps NOW is the time for change. We have several clients who are prepared to invest their money in training you.

All you have to bring along is your own initiative and thirst for knowledge and they will guide you along the correct path.

Salaries for 12 months' experience are £4200.

Please ring Angela Walsh, tel. 01-235 3215.

SPAN COMPUTER PERSONNEL

Permanent Division 01-235 3215
Contracts Division 01-235 4931

2 Hobart Place, London, SW1

★ JOB SATISFACTION

PROGRAMMERS

MIDDLE EAST
We would like to meet computer professionals on behalf of our client with around 4 years' ICL 1900/2900 G3 COBOL/PLAN experience to discuss long and short term assignments in the GULF area of the Middle East.
* Scope in a variety of areas
* Conversion plans
* Accommodation and expenses paid by company
* Renewable assignments
* Salary £12,000 TAX FREE

REF. 1699

★ SALARY

PROJECT LEADERS CITY

An outstanding opportunity exists within international finance group for 2 project leaders with experience at that level on ANY hardware, preferably in financial or insurance areas. Ideal candidate will have dynamic personality, confidence and self-motivation, be able to liaise at all levels and responsible to act on own decisions.
* Security in a growing organisation
* Mortgage assistance/STLS/Non-contributory pension
* 5 weeks' holidays/sub restaurant
* OPPORTUNITY TO TRAVEL ABROAD
* Salary £7K

REF. 1849

★ CAREER OPPORTUNITY

MINI PROGRAMMERS

LONDON
Prestige company operating on a global scale recruiting persons with 1-3 years' experience on ANY MINI ASSEMBLER to work in their new modern City offices. Having large DEC PDP11 equipment and expanding at a rapid rate they have a wide range of on-going projects both in hardware and software areas.
* Extensive training in up-to-date technology
* Excellent career opportunities
* Training in RSX11, RT11 and RSTS
* Opportunity for future travel
* Salary £6,500

REF. 1478

PL/I PROGRAMMER

LONDON
Why travel to London when opportunities exist? PL/I programmers, this well-known company with large IBM 370 equipment offer you:
* Security in a very well-established and long established O.P. division
* Training in IMS
* Prospects for systems
* Salary £5,000

REF. 1713

SENIOR ANALYST MIDDX.

Our client, a major organisation situated close to both M4 and M3 motorways, is seeking a Senior Analyst to act as PROJECT LEADER on a wide range of applications. If you have approximately 3 years' systems experience, preferably in ICL 1900 series environment and are able to demonstrate a professional approach to project management, apply NOW.
* Job security with a prestige concern
* Responsibility
* Excellent working condition
* FREE lunches, FREE Life Assurance
* Salary £6,500 + Company Car

REF. 1694

SALES PERSONS

ALL AREAS U.K.
Major world-wide organisation seeks enthusiastic self-motivated persons with proven record in sales; previous experience with computer or business machine manufacturer on advantage. Successful applicant will be selling variety of hardware or related software to industry, commerce and local authorities. Expected earnings well into five figures. Excellent career prospects and attractive fringe benefits.

REF. 1839

SYSTEMS ANALYST

HAMPSHIRE
Beautiful countryside surrounds this well-established NCR installation based near to the NEW FOREST and South Coast. Min. 2 years' experience in commercial or industrial systems preferably with NCR Century and Neol 3.
* Currently setting up strong team to develop existing on-line systems
* Introducing T.P. and Database modelling in marketing distribution and finance
* Discount on Company goods
* Subsidised lunch, sports/social club, pension scheme
* Salary £5,250 + Xmas bonus

REF. 1472

MINI PROGRAMMERS

HOLLAND & BELGIUM
We would like to hear from programmers on behalf of our clients with good MINI experience. If you have had at least 2 years' experience of ASSEMBLER on any MINI computer contact us IMMEDIATELY to discuss on-going projects in the above countries.
* Accommodation and expenses paid by company
* Renewable assignments
* Excellent scope in a variety of areas
* Salary—The sky's the limit. A.A.E.

REF. 1803

ICL PROGRAMMERS

LONDON
Due to development of their advanced computer systems, successful O.P. Services dept. seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years' ICL COBOL & PLAN experience.
* Training on IOMS Database
* Development to analysts
* Opportunities to join at senior level
* Applications in various areas providing an absorbing and interesting career
* Excellent perks include flexible working hours and 8 weeks' HOLIDAYS
* Salary £5,500

REF. 1649

SYSTEMS ANALYST PROJECT LEADER DESIGNATE

ESSEX
International company engaged in manufacturing, distribution and sales of well-known commercial products, seeks person with design and implementation of either stock control or processing, warehousing or sales forecasting systems in an IBM environment. He or she should have the potential to control Project team developing one or more of the above systems.
* Excellent working environment
* Paid overtime
* Flexible hours, 4 weeks' holidays
* Company expansion with additional hardware
* Distributed processing
* Salary £6,500+

REF. 1827

PL/I PROGRAMMERS

W. LONDON AREA
As part of a prestige, international group of companies, our client is now recruiting to programme with minimum 2 years' PL/I experience with Assembler on the design of manufacturing systems on the IBM series 1 mini computer.
* Excellent opportunity to be trained on the computer
* Versatility of IBM series 1 — in relation to the mainframe
* Working with up-to-date technology
* Excellent career opportunities including chance of working with micro-computer

REF. 1581

SENIOR PROGRAMMER

Our client is a major supplier of construction materials throughout the U.K. with a turnover exceeding £200 million. They run a modern computer centre situated in the pleasant outskirts of Oxford and wish to appoint a senior programmer. The centre operates an ICL 1901T (upgrading shortly) under George II. Successful applicant will have comprehensive COBOL experience and a knowledge of PLAN and FILETAB would be an advantage. Candidates would be expected to work with minimum supervision on their own initiative. Co. offers

- * Relaxed picturesque surroundings, but not too far from the city of the gleaming spires — it should be pointed out that because of the rural location applicants should have their own transport.
- * Opportunity to work in small friendly department.
- * Salary to £5,500.

KNIGHT

PROGRAMMING SUPPORT LTD.
27 Noel Street, London, W.1
Tel. 01-734 0152/3010 (24 hrs.)



Management Consultant

Computers
West Yorkshire, to £8,000

Our client is a well established and respected firm of Chartered Accountants operating on a broad client base both nationally and internationally. The requirement is for a professional consultant to operate within the Management Advisory Services Division of the firm. Reporting to the Executive Director responsibility will be in two main areas; feasibility studies, selection and advice on the installation of mini-computers for clients, together with program implementation; file

Interrogation and data capture techniques for large client installations. Candidates aged 28 to 40 will have a degree or professional qualification with up to date knowledge of the market place and sound computer experience either in a consultancy capacity or senior management position. Additionally they will be self-starters with the imagination and confidence necessary to operate at senior executive level in all aspects of industry, commerce and local government. The benefits package and prospects are first class.

P. Adderley, Ref: 17110/CW

Male or female candidates should telephone in confidence for a Personal History Form to:
LEEDS: 0532-448661, Minerva House, 29 East Parade, LS1 5RX.

Hoggett Bowers
Executive Selection Consultants

BIRMINGHAM, CARLISLE, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE, and SHEFFIELD.

WORLD SHORTAGE OF PROGRAMMERS

We need several more programmers to help us keep our lead in the Word Processor market. We design and write assembly code programs for 8080 and 2-80 microprocessors. You can have any job title you like (except, perhaps, Director), provided you can write code and make it work.
Experience of microprocessors would be useful — but isn't essential. We prefer working with graduates — or at least people of an equivalent standard. The main qualification is, however, the ability to produce useful programs from a minimum of specification — after all, if we tell you exactly what to do we might as well write the code ourselves!
If you want to know more about working for this small company in sunny Oaking, then ring Chris on Oaking (0306) 87789.

DATA
RECALL LTD.
Sondes Place, Oaking, Surrey



SALES PERSON HOLLAND

As Europe's largest suppliers of contract computer personnel to Holland, we require an additional sales person for our Amsterdam office. The successful applicant will have good computer experience, preferably with a sales background. He or she will be self-motivated and keen to travel. Remuneration will include generous guaranteed basic income, and a substantial commission. We will expect a successful person to earn in the range £15-£25,000 p.a. A car will be supplied.

Please reply to

The Directors

KNIGHT
PROGRAMMING SUPPORT LTD.

27 Noel Street, London, W.1
Telephone: 01-734 0152 (24 hours)

LONDON BOROUGH OF BENT SYSTEMS ANALYSTS

The Local Authorities in Greater London are seeking a Systems Analyst with responsibility for advising on computer systems and for identifying existing problems and recommending solutions. The successful candidate, male or female, who will hold the position of Computer Development Officer, will have full project involvement from initiation of feasibility studies, to evaluation for commercial packages and implementation within program requirements.
The current installation consists of an IBM 370/145 located at Acton with 1000 and printer on direct line from Bent.
Starting Salary will range between £8,345 and £16,887 p.a. depending on age and experience. Enthusiasm and ability to handle ideas to a wide range of professional staff are essential qualifications.
Further details and application forms from the Administrative Manager, Room 708, Bent House, High Road, Wembley Middlesex, Wembley, obtainable by 3 August, 1978. Telephone: 01-908 8371 (24 hour Answerphone service). Please quote Reference Number 7/82/C.

HAVE YOU TRIED... CUTTING CORNERS?

I am a PROGRAMMER/ANALYST/OPERATOR
(Delete inapplicable)

looking for Employment in the

area

Name

Address

Home No.

Work No.

Ext.

Cut out end post to

D.P. RECRUITMENT LTD.

KENT HOUSE, 87 REGENT STREET, LONDON W1R 7HF
TEL: 01-437 2862/3/4 (24-HOUR ANSWERPHONE)



Compower

APL TIMESHARING SALES CONSULTANT

The company:

Compower Limited is one of the largest computer service organisations in Europe with a turnover in excess of £12 million p.a. It provides a wide range of services to its parent the National Coal Board and over 900 other customers through six linked computer centres situated in the main industrial regions of the U.K. The Headquarters is at Cannock, Staffordshire.

The Job:

The Sales Consultant will be a member of a specialist team, working in an expanding and highly successful environment, supported by the most powerful interactive service available in the country — Compower's Powershare service. He or she will market APL Financial Planning and other time sharing services to Government, Local Authorities and Public and Private organisations throughout the U.K.

Requirements:

Applicants should be graduates and have some experience of using APL in a commercial environment or have experience in the application of interactive computer techniques to business problems.

Location:

At the Company Headquarters, Cannock, Staffordshire.

Salary:

£5,000

Pension, Holidays, etc.

The conditions of service and other benefits are those which might be expected of a modern progressive organisation.

Applications:

Brief details of career to date should be sent in the first instance to: Mr. E. W. S. Patten, Staff Manager, Compower Limited, Cannock, Staffordshire

SIEMENS

TECHNICAL TRANSLATORS AND EDITORS

To work in MUNICH or SUNBURY-ON-THAMES

Here is an opportunity for technically minded linguists or linguistically talented communications engineers or DP specialists to join the Translation Department of SIEMENS AG, Munich or SIEMENS LTD., Sunbury.

You'll be joining an expanding section specialising in the translation of Switching System Documentation (Software and Hardware) and Operating Systems Software from German into English.

Linguistic expertise is more important than formal qualifications. Ideally you will be of English mother tongue with an excellent command of German.

There are also a number of openings for FREE-LANCE TRANSLATORS with similar qualifications and experience as well as TECHNICAL AUTHORS familiar with DP software but with a limited command of German.

Excellent remuneration and working conditions are offered. Address your application to:

SIEMENS AG
Hauptstelle für Übersetzungen, Hofmannstrasse 61
8000 München 70, Germany



MESSAGE SWITCHING BURROUGHS GEMCO'S
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PDP FORTRAN IV RSX11M
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HONEYWELL 6000 GCOS COBOL
FORTRAN ADV
PDP RSX11 LONG CONTRACT

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£450 p.w.
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£400 p.w.
£400 p.w.

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ANALYST PROG IMS COBOL
IMS COBOL PROG
IBM SYST 3 RP81
PDP RSX11 FORTRAN
PDP RSX11 MACRO II
SNR ANALYST DATABASE DESIGN
ICL 2900 VMEB COBOL
BURROUGHS 6700 COBOL
ICL 1900 COBOL/BN
PDP MUMPS/BASIC OR ASSEMBLER
OL/I COBOL PROGRAMMER

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KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1. TELEPHONE: 01-734 0152/3 (24 HOURS)
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM



UNIVERSITY OF LONDON COMPUTER CENTRE

The University of London Computer Centre provides a regional computer service to the University of London and to Universities in the South East and South West of England. The Centre is equipped with a mainframe Data 7000, 6400 and CYBER 72 computer, and supports a large communications network of over 50 remote batch terminals and 30 keyboard terminals.

TELECOMMUNICATIONS A Senior Analyst/Programmer

is required to join a team engaged in the design, development and maintenance of telecommunications systems on mainframe and minicomputers. An exciting programme of development is planned which includes a major commitment to networking and new protocols.

Applicants should be educated to degree standard and have several years of experience in assembly language programming and telecommunications software.

SYSTEMS Two Programmer/Analysts

are required to join the operating systems team which is responsible for the development and maintenance of the SCOPE 2.1.4 and NOS/BE operating systems.

The work is challenging and involves evaluation and implementation of performance and other software improvements. The Centre is preparing plans for upgrading of its equipment; candidates will be expected to participate in any development.

One of these appointments will be made at a senior level and candidates for this post will be expected to have substantial experience in systems programming on a variety of equipment. Candidates with less experience are also invited to apply.

Candidates for both posts should be educated to degree level.

Salary will depend on qualifications, experience and age, and will be on a scale up to £7758 inclusive of London Allowance.

Holidays: 5 weeks per year plus Bank Holidays and 5 extra days.

Modern offices conveniently located for London Transport Services and Main Line Stations. Loans made to purchase Annual Season Tickets.

Further details and application forms are available by phoning Veronica Minors on 01-405 8400, extension 230, or by writing to the Secretary, ULC, 20 Guilford Street, London WC1.

Closing date for completed application forms 7th August, 1978.

Senior Analyst

Applications are invited for the post of Senior Analyst in the Computing Services Department. The successful candidate will be responsible for the systems required by the Administration (e.g. Student Records system).

The Polytechnic has recently installed a DEC-20 to replace a 1906E and the Administration programs are currently being converted.

This post will require a good working knowledge of COBOL, preferably gained on DEC-10 or DEC-20 systems. However, knowledge of ICL 1906 COBOL or RPG2 would also be an advantage. It is unlikely that an applicant who has worked for less than three years with COBOL would be considered sufficiently qualified.

Salary: AP6 - £4481-£4781 plus supplement of £312 p.a.

Further details and form of application available from the Assistant Director and Chief Administrative Officer, Trent Polytechnic, Burton Street, Nottingham. Closing date 2nd August, 1978.

TRENT POLYTECHNIC NOTTINGHAM

SCOTTISH SOUTH-WESTERN HEALTH BOARDS

INTERMEDIATE PROGRAMMER (£4,421-£5,326)

Applications are invited for the above post based in Glasgow, Dundee, Perth, Aberdeen, Dundee and Glasgow and Victoria, Inverclyde, Argyll and Bute, Dumfries and Galloway and Western Isles. Health Boards provide a wide range of clinical services and an integral part of the Information Services Division processes a wide range of information for Health Care, Planning and Management.

Applicants must have at least 2 years' experience of 1900 Cobol and be familiar with the use of ICL 1900 software and Gough P4 or Gough P5.

Knowledge of communications programming and use of ICL 1900 software would be an advantage.

Application forms and further details can be obtained from the Area Manager, Health Board, 150, Argyle Street, Glasgow, G2 7AT. Please apply to the Area Manager by return of this notice, with a covering letter, to the Area Manager, Health Board, 150, Argyle Street, Glasgow, G2 7AT.

You can join any one of 50 computer organisations as a customer engineer and go along quite contentedly, join us and there is every chance that you will be racing along the road to success.

As a company we are dedicated to achieving success. In just 11 years we have established ourselves as one of the "top 25" computer manufacturers in the U.S.A. and in the U.K. we are leasing out our hardware as fast as we can.

We make our customers a pledge: If they have a breakdown, one of our customer engineers will be with them within two hours. It is a promise. We do not break it.

If you join us - you will find you have divided loyalties between us and your group of clients. And that is just how we want it to be. You will work from home and need DNE Electronics and around 3 years' experience

maintaining mainframe or minicomputers and associated peripherals. We have vacancies now in Birmingham, London, Bricks, Oxford and Basingstoke. You will be our most frequent contact with our clients, so you will need a good personality and a sense of humour. Most important of all the determination to get the job done - at all costs under all circumstances. Back at headquarters we will look after you and treat you as an important member of our team. You will earn excellent money circa £5,000 plus at least another £1,000 for stand-by duties, plus a company car.

If you have all the drive, but up to now, no destination, take the road to success with Data 100.

Contribute to our success and your own. Contact: G. Hicks, Personnel Manager, Data 100 Systems Ltd, Arden Grove, Harpenden, Herts. Tel: Harpenden 83161.

Customer Engineers are our new breed of Diplomats



Amoco Europe Inc. Oil Industry Career for Programmer/Analyst

We are currently looking for a Programmer/Analyst to join a group of professionals involved in a wide range of commercial applications in the areas of finance, marketing and administration. Our installation comprises an IBM 370/138 operating under OS with data processing links to several European centres.

If you are INTERESTED in the "why" as well as the "how" of business and in the concept of following through a problem to its solution then we would like to hear from you.

You should ideally be a graduate with at least three years' programming experience in COBOL and IBM operating systems. However, we would also be interested in hearing from technical programmers who wish to change to commercial applications.

The benefit package will prove very attractive to those earning around £5000 p.a. and will include four weeks' holiday, luncheon vouchers and a contributory pension scheme.

For further information please contact Brian McIntosh, Amoco Europe Inc., 33 Cavendish Square, London W1M 3HF. Tel: 01-408 2135.



WANTED

ICL 2960-2980 Application Programmers for Europe

£12000-£15000 p.a.
& free apartment

Call (Reverse charge) D. Borrey
322 735 2819 or 648 9030

or write to
CORRELATIVE SYSTEMS INTERNATIONAL
rue General Lemanstraat 43/45
BRUXELLES 1040 BRUSSELS

SYSTEMS ANALYSTS AND PROGRAMMERS Tyneside to £5500

NO FORMS

NO APPOINTMENTS

NO DELAY

A major computer user based in Newcastle upon Tyne has vacancies for experienced systems analysts and programmers. Career development prospects are excellent and the systems varied including on-line applications.

CALL WITHOUT AN APPOINTMENT BETWEEN 4.30 pm and 9.00 pm AT:-

NEWCASTLE UPON TYNE
The Holiday Inn
Great North Road
Seaton Burn
Newcastle upon Tyne
Monday 24th July 1978
Phone Wideopen 5432

NEWCASTLE UPON TYNE
The Swallow Hotel
New Gate Street
Newcastle upon Tyne
Tuesday 25th July 1978
Phone Newcastle 25025

GATESHEAD ON TYNE
The Five Bridges Hotel
High West Street
Gateshead on Tyne
Wednesday 26th July 1978
Phone Gateshead 771105

DURHAM
The Royal County Hotel
Old Elvet
Durham
Thursday 27th July 1978
Phone Durham 66821

Ask at the hotel reception for Ivor Norton. If you can't come this week please telephone Harrogate 66628 (reversing charges) to make a firm date.

LOCAL JOBS

MAJOR GROUP BENEFITS

OFFERS THIS WEEK

Ivor Norton Management Services Ltd

P.O. Box 63, Copthall Tower House, Harrogate HG1 1TS. Tel: Harrogate 66628.

COBOL PROGRAMMER

★ Opportunities for early promotion ★

£5,500 p.a.

based N.W. London

Our client is the UK subsidiary of an American company engaged in the manufacture of interactive terminals.

The parent company has a well established computing function, and the UK subsidiary is now about to install its first ICL 2903. As a result, they now wish to recruit a capable and experienced Cobol Programmer to handle the implementation of a wide variety of accounting applications, some of which will be based on systems operational in the USA, and others which he will create himself.

The company's DP plans envisage a continuous growth and development for at least 4-5 years, and as there are currently no plans to appoint a Systems DP Manager, promotion prospects could be particularly good for the Programmer appointed.

In addition to practical programming work, there will be early involvement in systems design and you can expect to be working closely with the US computer operation in Texas.

Enquiries in the first instance by telephone to Tony Baker on 01-499 4501 (24 hour answering service) or if you prefer, write to him at the address below, quoting the reference RW 29/1.

ANALYSTS FOR TEHRAN

\$35,000 - \$45,000 P.A. Tax Free

Four experienced Systems Analysts are required by an American managed software house contracted to the Iranian Government.

Two are to work on the definition and design of Cultural/Demographic data collection, Statistics and Library Organisation methods.

Two are to work on the definition and design of Logistics Systems for the Military involving Inventory Control, Accounting, Supply and Distribution and Automated Warehousing.

After completion of the initial 18 month contract, future career opportunities will be available in the Middle East, Scandinavia and the UK.

Successful candidates can gain valuable experience on these very interesting and challenging projects, at the same time securing an excellent base for their financial future.

RW 29/2

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Programmers, Sales Engineers to bring in the next industrial revolution

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Our work is a particularly effective marriage between advanced electronics and real-time computing. And as more and more companies throughout the world put the message about what our systems can do for their businesses, so we need more men and women to join us in these key areas of our work. We started from scratch four years ago, and our staff now exceeds 35.

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You'll be individually responsible for software projects on both mini and micro-based systems. You'll need a sound knowledge of computer languages and a good understanding of the process control and data monitoring environment.

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As part of our current expansion programme we require additional specialist Sales Engineers, reporting to the Sales Manager, who will develop new outlets for our expertise in microprocessor/microcomputer-based Automation and Control Systems. Applicants should preferably be 25-35 should have a successful track record in technical selling of electronics associated with data acquisition, monitoring and control to the processing and general industries field.

Although we're a small, personal company, we've the full backing of BOC behind us. And although we're totally committed to tomorrow's technology we're in a part of the world where horses are still at yesterday's prices. Salaries negotiable up to £5,000 depending on age and experience. If one of those rules looks like the next step in your career, phone our Engineering Manager, Dick Slater or our Sales Manager, Peter Dickinson, in Daventry (STD 03272) 8026, or write to BOC Automation, 2 Morris Road, Roynal Oak Industrial Estate, Daventry, Northants NN11 6PB.



Automation

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This senior appointment will be of interest to those who have practical experience in all aspects of Bureau operations and have an entrepreneurial instinct coupled with a good knowledge of organisation planning.

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required urgently

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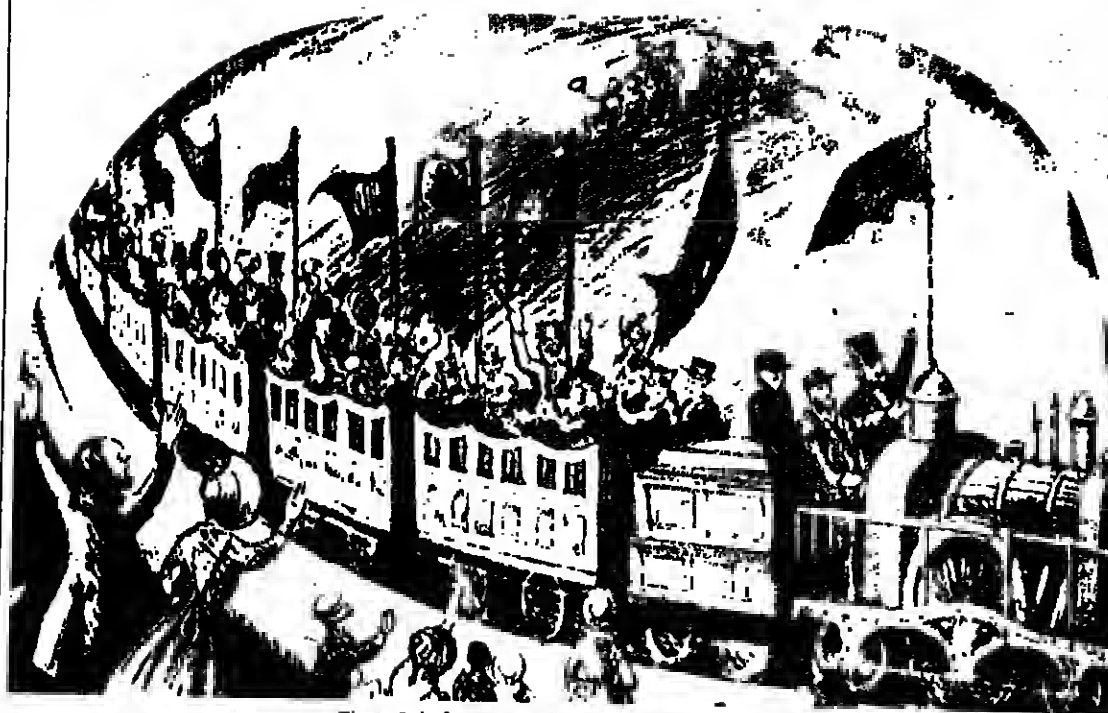
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A major on-line project involving IDMS will likely be your first assignment, therefore hands-on experience of a data base product or a teleprocessing project would be a distinct advantage.

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All candidates must have a good university standard of education with English Language and Mathematics among their O level attainments.

Relevant work experience is essential, but we are prepared to supplement your skills with specific training in appropriate technologies if you can demonstrate the basic abilities we are seeking. Our concluding interview is held in November annually.

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Main frame equipment is based on half-megabyte IBM 370/158.

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require an experienced

RPG II Programmer

to work in their Redditch Office. Salary is negotiable and excellent fringe benefits are available.

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Tel: Redditch

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Data Base Administrator

for new, multi-site, on-line system

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The men or women appointed will be expected to continually review data base performance; maintain control over its accuracy and security and make such changes as may be required to accommodate new applications and improve performance. There will also be some responsibility for defining staffing requirements.

This is an important appointment calling for a degree calibre person with around three years' experience at senior level in a data base environment, preferably on Honeywell IDS equipment.

The salary will reflect the responsibilities and importance of the position and benefits include 24 days' holiday, contributory pension scheme and, where appropriate, assistance with relocation expenses.

For more information, telephone our Technical Support Manager, Pete Trevell, on Helrow (0279) 2811 Ext. 2147, or write to: Jenny Sexton, Personnel Manager, ITT Components Group, Europe, Edinburgh Way, Harlow, Essex.

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Applicants should have a minimum of five years' experience working in a multi-programming environment with, at least, two years spent in a supervisory position.

Shift working is in operation and a shift allowance of £318 is payable.

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GLASGOW
G 1 7J

MERSEYSIDE COUNTY COUNCIL DIRECTOR OF COMPUTER SERVICES

JOINT COMPUTER UNIT

£9,883-£10,689 including supplement

The successful candidate for this post will lead the Merseyside Joint Computer Unit, which has responsibility for data processing for both the County Council and the Passenger Transport Executive. In addition work is done for and advice provided to Merseyside Police on computing matters.

An ICL 1904S under George 3, with 192K store and substantial communication facilities has been installed, and has about 2 years of its prime life to run.

The Director must be professionally or academically qualified, and must also be able to demonstrate proven and broad based knowledge of computing, and extensive top management experience. Additionally, experience of large machine management, involving the provision of an operational and development service to multiple location users would be advantageous.

General local government conditions of service apply to this appointment, including the provision of a car allowance and generous relocation allowances where appropriate.

Please write or telephone for an outline job description and application form to:

County Personnel and Management Services Officer,
Merseyside County Council
P.O. Box 95, Old Hall Street
Liverpool L69 3EL

Tel: 051-227 5234 ext. 2322

The closing date for applications is 3rd August, 1978, with interviews planned for that month.

**Merseyside
COUNTY COUNCIL**

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Write to, or phone Miss K. Lykes for an application form.

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Telephone: Farnborough (0252) 512268

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A large computer services organisation based in Paris requires

SYSTEMS ENGINEERS

to work on

IBM 370-158, 168 and 3031 computers

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The work will initially be located in Paris, with the possibility of moving to other sites in France and abroad, after the first year if desired.

Relocation expenses and an attractive salary will be offered.

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Ref. W1/2007

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ICL 1800 To £4,300
C. LONDON. TWO OPERATORS with some knowledge of GEORGE II/II+ required and a minimum of one year's total experience. A three-shift role in operation and conditions of employment include an excellent annual bonus scheme.

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HANTS. Positions for both OPERATORS and a SENIOR OP. with 12 months + exp. on 1900 or 2800 hardware. Swift career progression is offered both in operations and into related O.P. sections for applicants with related aptitude. Excellent working conditions including subsidised restaurant/bur. Pension scheme and 4 weeks' holiday.

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OS/VS1 experience is currently much sought after by many companies situated in the LONDON area. Salaries are highly competitive together with many varying company benefits. Mortgage subsidies. Travel concessions. Life Assurance. Pension schemes/LV's and OLPA. Contact Abraxas for further details.

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The specialist engineer is required to monitor and maintain the operation of telecommunications, line concentrator and transmission equipment. He/she will correct faults and overcome problems in the system and liaise with the British Post Office, terminal users and equipment suppliers.

Candidates must be qualified or suitably experienced telecommunications engineers with knowledge of either high or low speed equipment operating with both leased circuits and the public switched telephone network.

The candidate will be expected to work shifts covering the period 0700 to 2000 Monday to Friday and will be based in N.W. London.

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Please send brief details — in confidence — to David Bennell ref. PY.43553

This appointment is open to men and women.

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Apply with complete resume on academic and professional background, list of references, with copies of (a) university degree/qualification, including personal data such as home and office addresses, telephone numbers, family status (wife's maiden name, names of children, ages and sexes) to:

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Brough House, 7 and 8 Backville Street
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Applicants should either be

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The best products demand the best possible technical support. We need Senior Software Specialists for pre- and post-sales support to users up to our own sales and project teams. Candidates will have rare qualities: the ability to learn our product software totally, to troubleshoot in a wide variety of client environments, to advise creatively on proposed systems and products. They must be energetic and mobile. Ideally, candidates will have worked in technical support with a minicomputer manufacturer. Rewards and prospects will be excellent.

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Raytheon Cossor Data Systems

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UNITED KINGDOM ATOMIC ENERGY AUTHORITY

Harwell Central Computer

We have a vacancy at Executive Officer level for a Communications Controller for Harwell's Central Computer.

The work is concerned with the control and supervision of the network interfaces to the IBM 370-168, which provide for the attachment of over 300 terminals of various types. It will involve fault investigation and testing of network components (i.e., terminals, modems, connections, front-end computers) to instigate corrective action, planning and ordering new communications equipment and cabling, and supervising and progressing its installation and correct functioning. The Controller will also maintain records and logs detailing network components and allocations.

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Starting salary will be between £2727 and £4019 per annum, depending on age.

For an application form write to:

Mrs. S. Deakin, Personnel Department, AERE, Harwell, Oxon, OX11 0RA,
or telephone Abingdon (STD 0235) 24141, ext. 2059.

If you have any queries about this vacancy, please telephone Extension 3227

UKAEA HARWELL

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GERMANY (£11,000 p.a.)

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We require a Programmer with comprehensive Cobol experience, at least two years, in solving commercially oriented problems, e.g. Stock Control, Invoicing, Book-keeping, etc.

A knowledge of RPG would be helpful, but is not absolutely necessary.

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Salary consists of 13 monthly payments of 3,300 DM. Starting date: 1st-15th September, 1978.

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ANALYSIS
AND DESIGN)

Applicants should be graduates, or possess equivalent professional qualifications, and should have recent practical experience outside the field of education. The successful applicant will have a senior role in a small team responsible for courses up to honours degree level in Data Processing. Salary Scale: Senior Lecturer Grade 30 £51,270-£67,832. An application form and further particulars may be obtained from the Personnel Office, Sunderland Polytechnic, Chester Road, Sunderland SR1 1PF. Applications should be returned to this office by 21st August 1978.

TRAINEE SALES
for someone with
OPERATIONS/RJE ex-
perience. London or
Manchester based.
Telephone
01-828 7567MERSEYSIDE COUNTY COUNCIL
PROJECT LEADER
(£3,727-£5,702 p.a.)
SYSTEMS ANALYST
(£3,232-£5,535 p.a.)

The successful applicant will assist in the design and development of dedicated on-line computer systems for Merseyside Police, including developing and implementing Police Command and control and information systems from the Operational Requirements stage to maintenance.

Candidates should possess a professional qualification and a knowledge of N.C.C. standards of documentation would be an advantage.

The Project Leader should have a programming background, preferably in real time systems, with working knowledge of a high level language and two years' experience as a systems analyst.

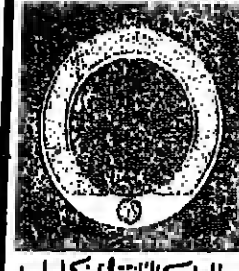
The Systems Analyst should have two years' programming experience, and a sound knowledge of CORAL 88, or equivalent language. Applications forms, returnable by 7th August, 1978, and further details from the Chief Constable, Merseyside Police, Police Headquarters, P.O. Box 59, Liverpool L69 1JD in envelopes endorsed with job title, or telephone 061-709 6010, ext. 2153.

SYSTEMS ANALYST
&
ANALYST/PROGRAMMER

PERMANENT or CONTRACT from September, INITIALLY TO WORK IN N.E. LONDON with our existing team to develop COBOL based MANUFACTURING SYSTEMS.

CONTACT: (AN GOLD on 01-388 0636)

Fraser Williams
computer consultants

IRANIAN NATIONAL BLOOD TRANSFUSION
SERVICE TEHRAN

To join team implementing
DG ECLIPSE BASED INTERACTIVE
COMPUTER SYSTEMS

which will support the operational functions: planning/budgeting tasks and staff administration of the Iranian National Blood Transfusion Service.

SENIOR ANALYST/
PROGRAMMER

approx. £18,000 (2,100,000 Rials) p.a. + termination bonus and car

He/she will undertake detailed systems design, with special tolerance to application oriented aspects and the systems/software interface: systems testing and documentation; user training and documentation; on-the-job training of Iranian analysts and programmers.

Applicants should have relevant university degree, 7-8 years' practical experience of systems design/implementation and of programming (in more than one language, including Assembly or equivalent), using several different makes of hardware on a variety of applications, in many years should have been working on the implementation of mini-based interactive systems.

SENIOR PROGRAMMER

approx. £16,000 (2,100,000 Rials) p.a. + termination bonus and car

He/she will undertake specification, checking and testing of programs (including the design of the most complex ones); scheduling and supervision of programming and programming documentation, technical evaluation and acceptance of software acquired from external sources; on-the-job training of Iranian programmers.

Applicants should have relevant university degree, 7-8 years' practical experience of programming (including the management of programming teams), a significant proportion of software development (including OBM and/or terminal handling), using several different languages, which must include Assembly or equivalent, an more than one make of hardware in recent years should have been working on program/software development for mini-based interactive systems in a senior capacity.

SYSTEMS PROGRAMMERS (two)

approx. £14,000 (1,800,000 Rials) p.a. + termination bonus

They will undertake the programming and documentation of the URM-related, (mainly handling and more complex application programs, will provide assistance, supervision and on-the-job training for Iranian application programmers.

Applicants should have relevant university degree, 5 years' practical experience of programming, a proportion of it on software development (related to OBM and/or terminal handling), using several languages including Assembly or equivalent, on more than one make of hardware; in recent years should have been programming for interactive mini-based systems.

All appointments will be for a minimum period of 18 months. A housing allowance is included in the salary and additional benefits include 3 weeks' paid holiday and 25 days' sick leave.

Applications (stating which appointment they are for), with curricula vitae, should be addressed to: Box No. 1957, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU; interviews will be held in London during August.

EDP Opportunities

Saudi Arabia £8,800-£10,900 (after tax)

The Arabian American Oil Company (ARAMCO), the major developer of petrochemical resources in Saudi Arabia, currently requires the following staff for its Commissary Department.

Systems Analyst/Programmer

You will study and document all EDP systems and procedures for its Commissary Department. This will include the preparation of user instructions and carrying out training sessions with EDP input procedures. You will have the ability to investigate and solve EDP related problems and, although not expected to write programmes, will be able to understand those already written. A good knowledge of COBOL, PL1 programming languages and a mark 4 training would be beneficial.

Stock Control Accountant

You will have a sound knowledge of inventory control procedures (preferably computer-based) and ideally you will hold a HNC in administration or accounting and at least 5-years' practical experience in materials accounting and stock control; a further 5-years' experience would however be a suitable substitute for formal qualification.

In both cases, a full UK driving licence is essential.

Bachelors have 30-days' paid leave between contracts; Married men on single status have two-weeks' paid UK leave every four-months and 25-days' leave between contracts.

For further details, please write or telephone quoting reference 8350 to Richard Darvell at Astral Recruitment Associates, 17/19 Maddox Street, London W1K 6EY. Telephone 01-629 2356 (ansafone after 6 p.m.).

ARA Recruitment Associates

<p>JUNIOR PROGRAMMERS £2900 to £4750 Just a year's exp or less? Apply now! All areas. All ages. All abilities.</p> <p>01-995 3863 FREEPOST LONDON W1A 3BR</p>	<p>CAPITAL APPS GRADUATES Urgently required for large positions in industrial, scientific, commercial, government, health, education, etc. All areas. All ages. All abilities.</p> <p>01-995 3863 637 5557 day 636 9659 eve</p>	<p>ASSEMBLER PROGRAMMERS £4000 to £6000 Manufacturers & Systems Houses need more of these. UK & Overseas.</p> <p>01-995 3863 FREEPOST LONDON W1A 3BR</p>
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SENIOR PROGRAMMER

WEST LONDON to £6000 + EX. BENEFITS

This is a marvellous opportunity for a programmer with upwards of 3 years' COBOL experience to join a first-class employer in West London. The company's premises are easily accessible from a number of local tube and main line railway stations, in addition, ample car parking is available.

Extensive ICL hardware is utilised and forms the base for a number of on-line systems.

Career development is encouraged, there is a friendly working environment and the company benefits are almost unbeatable. Interested? Then to find out more, why not ring the number below quoting ref: CW 23-8S.

01-888 9593 (24 HOUR ANSAPHONE) | 061-236 9085 FAULKNER HOUSE,
19 PARK STREET, CROYDON, C99 1TN | FAULKNER STREET, MANCHESTER M1 4YD
COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS | CAPP ASSOCIATES | Computing Services Association

SENIOR PROGRAMMER

THE COMPANY:

A statutory organisation providing insurance against the high cost of serious illness. V.H.I. has recently installed a Honeywell 62/80 Computer with disk and tape systems using 192K Memory and associated V.O.I.U.S.

THE CANDIDATE:

Applications are invited from persons with 3 to 5 years' Cobol programming experience, preferably on a Honeywell computer. Knowledge of Communications programming an advantage. The successful candidate will be capable of working as part of a team.

BENEFITS:

Attractive salary commensurate with qualifications and experience backed up by an attractive range of fringe benefits and excellent working conditions.

Applications giving full details should be made to the Personnel Manager:

VHI
Voluntary Health Insurance Board
AN BORO ARACHAUSIAE SHORALASH
VHI House 20 LOWER ABBEY STREET DUBLIN 1 TELEPHONE (01) 249171 24551

Basic Programmer

£3,250 - £4,500 p.a.

COMPANY:

Music Hire Group Limited is a rapidly expanding company in the early stages of developing a distributed processing system linking intelligent terminals in its ten regional offices to PDP 11/34 and PDP 8 computers.

POSITION:

The successful applicant will join a team of analysts and programmers and will be involved in writing programs on PDP 11/34 and Micro Processor machines. Some systems work may be involved depending upon applicant's ability.

EXPERIENCE:

One year's programming experience, preferably in a commercial environment. Please write or phone:

Mr. P. A. Riding
Data Processing Manager
Music Hire Group Ltd.
Low Lane, Horforth
Leeds LS16 4ER
Telephone 558455 ext. 238

MHG MUSIC HIRE GROUP

CITY OF LONDON
POLYTECHNICSENIOR
COMPUTER
OPERATOR

The Computer Service provides comprehensive computing facilities for ILCA Polytechnic, Schools and Colleges.

A large multi-access real-time system is installed in a self-contained computer building of the Polytechnic incorporating medium speed main store, on-line disc store, a full range of peripheral and support over 100 local and remote interactive terminals.

In addition two smaller systems provide multi-access for Schools and Colleges of the ILCA.

The Senior Operator will join a small team working a two-shift system. Preference will be given to applicants with operating experience / supervisory experience in a medium / large multi-access installation. However, all applicants received will be considered on their merits.

Salary offered is on a scale from £3,650 to £4,288.00 (under revised plus shift allowance of £257 p.a.)

Annual holidays are 21 days plus 1 day per 5 years' experience.

Further particulars and an application form may be obtained by applying in writing to the Assistant Secretary, City of London Polytechnic, 117/118 Houndsditch, London, EC3A 3BU

Closing date will be 3rd August, 1978

THE UNIVERSITY OF
MANCHESTER
FACULTY OF ECONOMIC AND
SOCIAL STUDIES

There is a vacancy for a:

COMPUTER
PROGRAMMER

in the Research Support Unit, to assist staff and postgraduate with their computing problems. Applicants should be graduates with a responsible position in a computing department, preferably with some study of statistics. Knowledge of other ALGOL, COBOL or FORTRAN is essential. Candidates familiar with the University's Regional Computer Centre system will be preferred. Appointment is initially for one year but is potentially permanent. Salary range p.a. £3,180-£4,500. Particulars and application form (returnable by July 20th) from the Registrar, The University, Manchester M13 9PL. Closes 17th July 1978.

CONTRACTS

PROGRAMMING &
ANALYSIS

LONDON & SOUTH

EXCELLENT RATES

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M & W Computer Consultants Ltd.

235 London Road, Croydon

MINI
SOFTWARE
EXPERIENCE

£6-£8,000

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01-686 9693 (24 HOUR ANSAPHONE)
19, PARK STREET, CROYDON, CR9 1TN

061-236 9085 FAULKNER HOUSE
FAULKNER STREET, MANCHESTER
M1 4YD

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS | CAPP ASSOCIATES | Computing Services Association

MICROSTAR ★★★★★★★★★★
Communications
Network Controller

£6,000 negotiable Surrey Based

Our client is a substantial engineering corporation with factories and associated data processing facilities in all major European countries, linked by a modern telecommunications network and mixed mainframe/minis of advanced specification.

The advertised position offers great freedom of action to an experienced communications specialist who will need to liaise on a national and international level with all the main disciplines associated with such data processing — end-users, divisional management, mainframe technical support experts, etc.

The salary and other rewards for this position are in keeping with the status of the client's international activity.

Write initially with brief career details to:
The Managing Director
Microstar Limited
Hitherbury House
97 Portsmouth Road, Guildford, Surrey GU2 5DL
Telephone Guildford (0483) 33031

★★★★★★★★★★★★★ MICROSTAR

CALCOMP
OPERATORS

An experienced Calcomp (or similar) operator is required to operate our CALCOMP 748 Flatbed and 1061 Drum Plotters.

An excellent salary will be offered. Modern offices and friendly atmosphere. Opportunities for progression into Data Processing.

Forward requirements to:

Data Processing Manager
Goodway International Limited
Orchard Lane, East Molesey, Surrey KT8 0BY

NORTH STAFFORDSHIRE POLYTECHNIC
Boscastle, Stafford

DEPARTMENT OF COMPUTING

RESEARCH ASSISTANT

Applicants are invited, from suitably qualified graduates, for a post as Research Assistant in one of the following fields:

1. Speech understanding systems;
2. Computer Architecture — development of graphics, data capture systems and associated interfaces;
3. Microprocessor systems development.

Salary: £2727 per annum including supplements.

A second post is available in one of the above areas for which a Science Research Council Studentship is available.

Further details and application forms are available from the Establishment Officer, North Staffordshire Polytechnic College Road, Stoke-on-Trent ST4 2DE.

OPERATORS

IBM 360/50 OPERATORS
This is a full time position. The Bank benefits include a CIPAP scheme, pension and private health insurance. Excellent salary and benefits.

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It makes more sense to deal with the Organ-Grinder

The way we see it, when you're looking for a new job there's only one person you should have to talk to and that's a potential employer. We can arrange it.

Once we receive the coupon below... we'll send you a confidential application form. Think of it as an interview - fill in all relevant details about your achievements, ambitions and the companies you don't want to join. Leave the rest to us.

We'll compare this information to the needs of our clients - some 3000 major companies from industry and commerce. Each time the two match up, you'll be shortlisted for a key job... one which may never have been advertised. Our clients will then contact you direct. We can help save your time, your energy, your money and you could find a better job sooner than you think. Lansdowne Appointments Register, Design House, The Mall, London W5 5LS. Tel: 01-579 2282 (24 hour answering service).

Lansdowne
For those too busy doing a good job to find a better one.

Our clients are keen to meet men and women, aged 20 to 40 years, with potential earnings of between £4000 and £7500 p.a.

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Address: _____

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HAMILTON RENTALS

Hamilton Rentals is a young and dynamic company involved in the rental and sale of Office Equipment and Computer Products. Due to our continued rapid expansion we are now installing a DEC PDP 11/70 computer at our Head Office at Wexham, NV London, to provide full on-line facilities to our Branch Offices in England and Scotland. To develop this system we need to employ the following personnel:

SENIOR PROGRAMMER

£4,500-£4,800
Must have a minimum of 2 years' programming experience on PDP 11 or similar equipment. A working knowledge of RSTS/E and/or BASIC PLUS would be desirable but not essential.

PROGRAMMER

£3,800-£4,100
A minimum of 12-18 months' programming experience is required, ideally in an interactive environment. Familiarity with PDP 11 would be an advantage.

For the right people we can offer:
★ Regular salary reviews
★ Non-contributory pension scheme
★ Spacious modern offices
★ Stimulating working atmosphere
★ Excellent career prospects

If you think you fit the bill, please write or phone for an application form to:

Caroline Williams
Personnel Officer
Station House, Neasden Lane, Neasden, NW10
Tel: 01-450 8239 or 01-729 3444

BASIC PROGRAMME/ANALYST - £5K PLUS

If you like the idea of working for a small Software House in Mayfair, and have 2 or more years' experience programming in commercial BASIC, we'd like to hear from you.

There are 2 jobs available and we work in a friendly and relaxed atmosphere. Clients range from local businesses to major multi-national organisations with interactive systems across the world.

If you need responsibility, challenge and enjoy an informal environment, call:

Robbie Cocking or Brian Dwyer
01-493 6175

FREELANCE PROGRAMMERS

£150 to £250 p.w.
We are looking for experienced freelance programmers to work on a variety of projects. If you are interested, please contact us.

01-896 8883
HARRISON LONDON W4 3ER

Middle East Systems Consultant

c. £18,000 tax free
Information Processing
Satellite Data

Our client, a European-based Consultancy organisation, has recently been awarded a contract to Analyse and Specify requirements and then Design, Develop and Implement systems to be processed on large IBM 370/158 and used at the centre.

Application areas include Weather Forecasting, Resources Management, Cartography, Image Data Processing, etc., based on information received from a centralised Satellite Data Gathering unit.

Although the Consultant's main role will be in the Definition and Design of the Database system, he/she will work closely with the Centre Director, and will have total involvement through all stages to final implementation. The initial contract period will be for one or two years with renegotiable end of contract options. Remuneration in excess of the above figure may be considered for exceptionally well-qualified candidates.

For further details or informal discussion, please contact Roger Abington on 01-242 9385 (day) or 01-242 9386 (evenings/weekends). Ref: 3615D/CW/RA

Computing Services Association

CAREER OPPORTUNITY IN IRAN

A major Iranian computer service bureau needs the following Data Processing Professionals to meet the demands of a rapidly expanding business:

SYSTEMS PROGRAMMER

Minimum 5 years' experience. Knowledge of 370 Assembler, COBOL, DOS/POWER/VS, CICS assembler. Experience in data base design and computer systems measurement + performance enhancement would be advantageous.

SOFTWARE DEVELOPMENT

Design and development of new products. Knowledge of 370 Assembler COBOL and DOS/VS plus 5 years' experience.

SYSTEMS ANALYST

At least 5 years' experience including successful implementation of at least one major project. Familiarity with on-line applications and data base management would be advantageous in satisfying the position objectives.

Applicants for all the above positions should possess a University degree. Interviews will take place mid-August in London. All applications will be acknowledged.

Please submit resumes in strict confidence including salary history to:

CMS IRAN-HAMBURG CO. LTD.
Steintorweg 4-8
Hamburg 1, West Germany

Senior Computer Operator

Salary £3278-£4148 (including supplements) required in Borough Treasurer's Department for 10/1/2804.

Consideration will be given to provision of housing accommodation and payment of removal and legal expenses. Starting salary will be dependent on age, experience and qualifications, etc.

Application form from Borough Treasurer, P.O. Box 4, Town Hall, Gosport, Hampshire (for telephone Gosport 07017) 84242 ext. 108)

Gosport Borough Council

LEADING INTERNATIONAL BANK

ONE OF THE WORLD'S LARGEST BANKING GROUPS IS EXPANDING ITS EUROPEAN AUTOMATION STAFF DUE TO THE SUCCESS OF THE INITIAL PHASES OF A SUBSTANTIAL INTEGRATED BANKING SYSTEM DEVELOPMENT PROGRAMME

Opportunities have arisen at three levels:-

SENIOR BUSINESS ANALYSTS TO £6,500 +

Two positions exist at this level:-

- 1) Within the Systems Management Group responsible for the integrated banking system in six continental European branches. This position will be London based with the advantage of frequent European travel.
- 2) Within the Project Group responsible for the provision of automated systems additional to the integrated banking system. This position will also involve some European travel.

The experience required for these two positions is as follows:

- ★ Good practical knowledge of International Banking
- ★ Minimum of three years' systems analysis experience in a banking environment
- ★ Ability to communicate effectively at all levels
- ★ A practical appreciation of O&M skills and practices

The successful applicants will be required to become involved in all phases of automation projects.

SENIOR PROGRAMMER ANALYSTS TO £6,500 +

Two further positions:-

- 1) Within the Systems Management Group responsible for the integrated banking system in our London Branch.
- 2) Within the Systems Management Group responsible for the continental European Branches. London based with frequent European travel.

The experience required for these positions is as follows:

- ★ Minimum of three years' experience of analysis and systems design
- ★ Solid programming background
- ★ A good knowledge of mini-computer technology, PDPII range preferred
- ★ Experience of BASIC, an advantage but not essential
- ★ Banking systems experience would be considered an asset

ANALYST/PROGRAMMERS TO £5,500

Positions have arisen at this level within a number of the automation projects. Successful candidates will be able to demonstrate either:-

- a) A good banking background. Previous practical involvement in the implementation of automated systems. A desire to become involved in all aspects of development and implementation

OR

- b) A sound programming background preferably gained in a banking environment. A desire to extend knowledge and experience into the area of systems analysis, design and implementation

These positions offer considerable career advancement opportunities to intelligent and versatile applicants.

BENEFITS

Additional to the substantial salaries there is a generous package of valuable benefits:-

- Subsidised mortgage
- Non-contributory pension
- Free life assurance
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- Fully expensed European travel
- Personal loans

For further information please contact MARK IRENS quoting reference CW/37/2.

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CHANGE TO IBM

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A leading manufacturer of equipment for the Print industry winning several Queen's Awards for Industry (in the export market), now requires OPERATORS to join their friendly team running a Century 75. There will be a complete CHANGE OF MAINFRAME to a SYS 3 MOD 15D in the summer, coupled with a move to a NEW COMPUTER SUITE and the introduction of a TP NETWORK.

It is envisaged that the successful applicants will have 6-18 months' experience on NCR equipment and can show the initiative and responsibility to become an integral part of the organisation.

The installation is easily accessible by public transport and a holiday bonus is paid.

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dp

Programmers

We're keeping up Croydon's reputation for pace setting developments

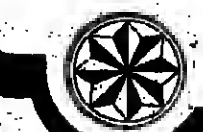
From our location at the centre of the Whitgift Shopping Centre, Northern Star Insurance are in the first phase of an important new development. We've already installed our IBM 370/138 computer, 80 + VDUs will be added during this year and next year. The implementation of our 2000 M Bytes On-Line Company Data Base is essential to our planned expansion.

Two years' experience of writing in COBOL may be enough to qualify you. Naturally on-line experience would be better still, particularly in CICS. But if you're flexible and dedicated, we'll provide any necessary training. Salary will be between £4,000-£4,500, depending on experience.

Our prestige offices and DP accommodation are within five minutes' walk of East and West Croydon BR Stations - with car parks close by.

So travelling to work will present no problems. And, in addition to ideal working conditions with a company that is not too big to care about individuals, we offer half-yearly bonuses, a non-contributory pension scheme, luncheon vouchers, and staff club amenities including a licensed bar.

To find out all the details, phone or write now to Mike Buckingham, our Personnel Manager, NORTHERN STAR Insurance Company Ltd., Rothchild House, Whitgift Centre, Croydon CR9 1NP. Telephone: 01-886 5678 (please reverse the charges).



Northern Star

BOROUGH TREASURER'S DEPARTMENT Senior Systems Analyst

Salary up to £6,345 p.a. i.l.s.

As Senior Systems Analyst (male or female) you will be the project leader in the Planning and Technical Services team dealing with a variety of non-financial systems most of which will be new projects. You should be an experienced Systems Analyst capable of undertaking with a minimum of supervision feasibility studies, systems design and implementation and User Staff training.

A 38-hour week with flexible working hours is in operation and the annual leave entitlement is 27 working days.

For further information telephone: Ray Brown on 01-827 8844 Ext. 334.

For application form apply to the Personnel Officer, Town Hall, Forest Road, London E17 4JF. (Telephone: 01-831 8898 - 24 hour answering service).

Closing date: 4th August 1976. Please quote Ref. B.1329.

London Borough of Waltham Forest

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

(University of London)

Koppel Street, WC1E 7HT

TUC CENTENARY INSTITUTE OF OCCUPATIONAL HEALTH

COMPUTER PROGRAMMER

is needed to carry out data processing and computer programming within the Institute and to give computing assistance to staff and postgraduate students.

Applicants should be experienced in the use of packaged programs for analysing survey data.

Working knowledge of FORTRAN and some familiarity with basic data are desirable. The gross salary (under revised pay scale) is £14,000 or £14,250.

Applicants should send full career and education details and holding this release: should be sent to the Institute at the School.



11, Stamford House
Stamford New Road
Aldersham
WA14 1BL
Tel. 081-941 4500/001-928 5265

Contract Requirements

£150-£300 per week
(plus expenses where applicable)

ICL

Analyst — 1900 — Newcastle — 3 months
System 4 Programmer — Oxford — 6/12 months
Nest III, COBOL Programmer — North West — 3 months
System 4 Unisys Programmer — North West — 9 months
1900 Driver, 2903 — ETR Programmer — North West — 2 months
1800 George III writing based — North West — 3 months
2800 VME COBOL + IBM experience — Programmer — Luxembourg
(October Start)
1900 Plan Programmers — Scotland — 3 months
2850/60 COBOL Programmers — North West — 6 months

OTHER

Singer 1500 Programmer — North West — 4 weeks
Analyst H/W 66 — Newcastle — 8 months
Singer System 10 — various — 3/6 months
O + M Analyst H/W 66 + 1800 — Newcastle — 6 months
Hewlett Packard 3000 + Imago database — North West — 8/12 months
Coral Programmers — North Sea Oil Rig — 6 months (2 weeks onshore/2 weeks offshore)
Varion COBOL + DAS Assembler — North West — 3/6 months
Dibol Programmers — North West — 3 months
RSX II — Software/Message Switching — London — 8/12 months
Level 60 CMAP — Scotland — 3/6 months

All of these contracts start within the next 2 weeks (except where stated).

For more details of these and other requirements please contact:—
Sue Davies or John Christian on the above office numbers.

Tel. Evening/Weekend
Sun — 081-707 1580
John — Reddick 54728



Emp. Agency Licence No. NW419

Computer controlled telephone exchanges U.K. and Holland

A recent large order from Saudi Arabia for the manufacture and supply of computer controlled telephone exchanges has confirmed Philips position as one of the world leaders in this field.

This, plus enhancements and additions to the range of switching systems has created vacancies within the international development team working on these systems. Opportunities exist at the U.K. base in Malmesbury, Wiltshire, where laboratories of Philips Telecommunications and Pye TMC are located and at the Dutch headquarters of Philips Telecommunications in Hilversum.

The development effort extends into the fields of space and time division switching, local and trunk applications, the integration of microprocessors and network maintenance and management centres.

The following staff are required to work in the area of real time telephony application, basic operating system design and general support tools.

Software Systems Designers

At least 4 years experience in real time or control systems software design is essential. Telephony or telecommunications experience would be an advantage.

Systems Programmers

At least 2 years assembler language experience is required. Experience on small computers and/or control systems would be advantageous.

Programmers

Applicants should be either recent graduate level or from a course with a large computer content of programming experience in a high level scientific language.

Salaries for the U.K. vacancies will be within the range £4,000 to £7,000. The Dutch vacancies can be filled either on a permanent basis or on a two/three year contract basis.

Malmesbury is situated in the north west corner of Wiltshire and combines a town of historic interest with all the amenities of a modern community. Motorway systems and good class roads bring it within easy reach of most major towns and cities.

Hilversum is located approximately 20 miles east of Amsterdam.

Please write with full details of career progression to Jane Thomas (SBS), Pye TMC Ltd., Swindon Road, Malmesbury, Wiltshire.



Project Managers, Systems Analysts, Cobol Programmers Amongst the best opportunities in Essex!

Chloride Automotive Batteries is the largest and most successful British manufacturer of lead-acid batteries. As part of the International Chloride Group we offer excellent experience and promotion prospects.

The company has announced its intention of replacing the ICL 1802S at Dagenham with a 2800 series and to embark on a new and substantial systems development programme. It will cover new real time systems in the commercial manufacturing and financial areas, using the latest communications and data base techniques.

Benefits include a good salary, contributory pension, life assurance and sick benefit scheme, four weeks' holiday, subsidised staff restaurant, active sports and social club and generous relocation assistance if needed.

Applicants should telephone or write for an application form to M. Barry, Personnel Department, Chloride Automotive Batteries Limited, Chelmsford Lane, Dagenham, Essex RM8 8PX. Tel: 01-552 4560.

Project Managers up to £7,000.

5 year's experience in commercial programming and systems development, knowledge of on-line data base techniques and project management experience is essential.

Systems Analysts £4,250.

2 year's good commercial systems analysis experience coupled to an ambitious professional approach, some knowledge of on-line systems and data base techniques would be an added advantage.

Cobol Programmers £5,250.

With upwards of 2 year's 1900 cobol experience. A knowledge of Plan, Driver or George II would be an advantage.

CHLORIDE

Programmers

with one year's IBM
Cobol, unlimited pro-
spects to £6,000 p.a.

Interviews any time,
anywhere

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24 hours

Queen Mary College University of London COMPUTER SCIENCE & STATISTICS DEPARTMENT

Lecturer/Temporary Lecturer

Preference will be given to candidates with research interests in Computer Systems, Hardware and Software. Teaching experience is desirable. Salary in lower half of scale £10,500-£12,000 p.a. plus £400 London Allowance.
Applications should be sent to the Registrar, Queen Mary College, 100 St. Dunstons Road, London E1 4NS, to be received by 15th October.

Programmers and Analyst

Circa £2,000 to £5,500 negotiable

We are an established software house in commercial applications and require the following staff to work on a full-time basis:

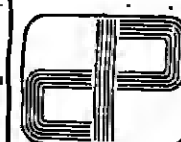
ANALYST — having one year's systems practice in addition to sound programming background.

PROGRAMMER — having at least one year's programming experience.

JUNIOR PROGRAMMER — having up to one year's programming experience.

TRAINEE PROGRAMMERS — having completed a university or technical college course in computer science.

Applications in writing stating full details of experience, employer, age and salary, to: **Immed Ltd.**
100 St. Dunstons Road, London E1 4NS



Computer Data
Processing
Limited

EXPERIENCED OPERATIONS STAFF

Salary £4,400 p.a. (inc. shift allowance)

Due to further expansion, experienced operators and control clerks are required to join our efficient and hard working Operations Team.

The configuration consists of two large ICL System 4/72s plus VDUs and RJEs.

Ideally, applicants should have two years' experience on either System 4 or IBM 380/370 machines and a good knowledge of JCL.

Three-shift working is in operation in both the Computer Room and Control Department.

A 32½-hour week is worked plus four weeks' holiday after one year's service.

Our office is located very close to the main-line station (London 43 minutes and Brighton 15 minutes).

Applications to:
Alan Merrion
Operations Manager
Computer Data
Processing Ltd.
Oakfield House
Perryman Road
Haywards Heath
Surrey
Telephone:
Haywards Heath
99185

ipc

HALTON BOROUGH COUNCIL CHIEF FINANCE OFFICER'S DEPARTMENT COMPUTER SECTION

An Order has been recently placed for an ICL 2904 with Discs, Magnetic Tapes and DDE's to replace the present ICL 1901 installation and is due to be commissioned in the Autumn. It is envisaged that future developments will cover a wide range of applications including on-line systems.

SENIOR ANALYST/ PROGRAMMER

Grade AP5/50 £4,773-£5,508

Applications are invited for the above posts from persons with several years' systems experience using Discs and Tapes and a programming background which includes COBOL. The successful applicant must be able to take charge of a system from investigation to implementation and be capable of negotiating with user Departments. A knowledge of ICL 2903 job control language and direct data entry equipment is desirable but not essential.

ANALYST/PROGRAMMER

Grade AP3/5 £3,732-£5,073

Applicants must have at least 2 years' COBOL programming experience using Discs and Tapes and a minimum of 1 year's systems analyst work. The above posts are based in Widnes, and a system of flexible working hours is in operation. The Council will be willing to pay in an appropriate cases reasonable removal expenses and make available accommodation to the successful applicants.

Applications in writing, giving details of age, qualifications, experience, together with the names and addresses of two referees, should be forwarded to the Head of Personnel and Management Services, Halton Borough Council, Municipal Building, Kingsway, Widnes, Cheshire, WA8 7DF. Closing date 21st July, 1978.

R. Turton
Chief Executive

COURSES

University of Southampton DEPARTMENT OF COMPUTER SCIENCE SRC SHORT DURATION COLLABORATIVE TRAINING AWARDS (SDTA) 1978

The Department has in conjunction with RAYCREEK Ltd., a project proposed on the terms set out for 1978. Applications for a studentship will be considered by SRC on the 1st October 1978 for a period not exceeding 12 months.

The project: 'The development of a computer based system for the control of a process'.

The project will be carried out in the Department of Computer Science, University of Southampton, Highfield, Southampton SO9 5NH. The main purpose of the project is to develop a computer based system for the control of a process.

Interested candidates should contact Professor A. J. Cook, Head of the Department in the first instance, Tel. No. 041 552 4400, ext. 3222.

Data-bases & Security

Logica is already active in the rapidly developing field of data-bases and systems security. We are keen to recruit more senior staff with experience in:

- data-base administration
- particular packages especially Codasyl, IMS, TOTAL, ADABAS, mini-computer based systems
- data integrity & recovery
- data management in distributed systems
- systems security especially audit

You should have worked in one or more of these areas and be keen to develop your experience by solving problems for Logica's clients in the UK and overseas. You will also need the personality and ability to communicate effectively with all levels of technical and managerial staff. Based in central London you will have the opportunity of working with other experienced and highly motivated staff. We would expect you to contribute to the development and growth of these dynamic business areas.

Arrange a meeting with one of our senior professional staff by calling Paula Freed on 01-637 9111, or write to her for an application form—Ref. S36/A. Logica Limited, 64 Newman Street, London W1A 4SE.

Systems Performance Measurement & Simulation

Logica's computer performance analysis have pioneered measurement and simulation techniques since 1969. Demand for our services is such that we need to recruit staff with general experience in:

- systems programming especially IBM VS, Honeywell GCOS, ICL 2900 VME
- use of hardware or software monitors to tackle performance problems
- capacity planning (sizing) using simulation

If you're good, we can help you go further

logica

HOLLAND — BELGIUM CONTRACTS HOLLAND

IBM Assembler — PL/1 Programmers, £300+ p.w.
IBM Cobol/Assembler Programmers, £375+ p.w.
IBM OS/VS Systems Programmers/Analysts, £325+ p.w.
IBM OS Operators, £200+ p.w.

PERMANENT Holland (H)/Belgium (B)

IBM OS/VS Systems Programmers (H), £13,000+
IBM MVS Systems Programmers (H), £15,000+
Mini Programmer/Analysts — Consultants (H), £8-£16,000
Burroughs Systems Programmers, Algol (B), £13,000
Operators—Large Multiprocessing Systems (B), £7,000+

We always assist with relocation and expenses, and provide help in finding suitable accommodation whenever possible.

Telephone Bill Seymour on
01-637 5001 to discuss



Accord Computer Efficiency



Computer Appointments

ANALYST/PROGRAMMER £5,250+BONUS PROGRAMMER £4,500+BONUS HOUSING AVAILABLE

Our Client, one of Europe's largest suppliers to the Engineering Industries, started off as a family concern. Having been bought by one of the UK's largest Companies, it still retains its family atmosphere. To them people count.

The emphasis is on Development and On-Line work. It is moving through On-Line Order Entry to a Stock Control System, and Production Control, using an ICL 2904 and RPG II.

The Analyst, who will be based in King's Norton, will need System 3, 32 or 34 experience. He will be responsible to the DP Manager and will be liaising at Director level.

The Programmer, who must have 2903, 4 or 1900, and On-Line experience, will be based at Redditch.

For both positions RPG II is a must.

PHONE BILL BYRNE ON 01-439 6299
(REVERSE CHARGES)

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PROGRAMMERS—FORTRAN—NORTH-
WEST
PROGRAMMERS—IBM DOS/OS COBOL—
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IBM—W. COUNTRY—URGENT

NORTH WEST — ANALYSTS

Packages to £7,500 + O/T pay

The E.M.S. consulting group has a large quantity of vacancies for additional Analysts to handle expanding systems requirements in the North West region. Candidates should have a minimum of 2 years' systems experience and preferably although not essentially, past programming experience. Our major current requirements are for both Analysts and Senior Analysts to work on commercial systems development. Projects will include Ledger Systems, Stock Control, Warehousing and Distribution Chain Store Systems, Database and Network Systems. Ability to work in conjunction with client team members and maintain a high professional standard will be important. Relocation assistance will be paid where appropriate. Telephone our Birmingham San Centro urgently for early interviews on 021-454 7906 (Donis Fibry/Don Philp). Please complete the attached application form in addition and return to Newcastle. Stills today. Over 20 current vacancies are available at very attractive salary levels.

TOP SALESMEN AND SALES MANAGER

E.M.S. is planning substantial further development of both our Consultancy and Turnkey Systems Divisions during the coming months. Our Consultancy activities extend across all mainframe ranges and encompass a wide range of industrial/commercial organisations. Applications must, therefore, present as high level Business Analysts capable of rapidly assessing clients' requirements and proposing relevant solutions where appropriate or programming and installing the relevant software. E.M.S. resources: a vast potential market exists for salesmen marketing resource support.

Equally, our Turnkey Systems Division provides total U.K. coverage.

ANALYSTS & PROGRAMMERS**BIRMINGHAM**

To £6,500

We currently have a large volume of vacancies throughout the Birmingham and West Midlands regions, including a wide variety of new jobs at the rapidly expanding E.M.S. San Centro.

COBOL AND ASSEMBLER programmers should complete our application forms today as an urgent priority. We have an unparalleled range of vacancies available. In addition to hundreds of client vacancies, E.M.S. also have for candidates seeking the opportunities of consistently working on new development projects within our modern, attractively furnished Data Centre. Your career development projects within the Midlands? E.M.S., as the largest recruitment consultancy in the country, has opportunities available for all 3 levels of staff which are unrivalled throughout the Midlands. Equally, please do not hesitate to complete and return the attached application form. For only a few minutes initial contact you will be able to see the investment opportunities for you make your own worth the investment.

Consultant: Don Philp/John Wood.

10K-20K (and it is earnable!)

marketing Honeywell Lovel 6 mini-computer systems and supporting software to a wide range of U.K. users.

Experienced Salesmen capable of developing their own territories are urgently required. A substantial quantity of leads are also supplied by extensive and vigorous advertising campaigns and Road Show ventures. Salesmen must possess an adequate mini-computer knowledge for Turnkey Systems solutions. *Can we provide you with a wide range of salaries and high prospective incentives. Apply by telephone for interview during the next week at our Birmingham Data Centre. All U.K. territories will be controlled from the pending regional development of other Centres.*

Consultant: John Wood.

We have many contract vacancies advised each week. Telephone now for a Contractor's profile form urgently and we will offer you an unrivalled selection of opportunities each month. Even if you are not available for a month or two, register today and let us reserve top opportunities for you to be phased on to later. Telephone 0782-623665 (10 lines). Don Philp, Don Walklate, John Wood, Selina Mills.

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Staffordshire ST5 2RS
Telex: 36636

Project Leader

c. £7000

plus mortgage subsidy

Grindlays Bank Group is a British-based international Bank employing 13,000 people in 35 countries. EDP has long been critical to our efficient operation; we are currently extending the UK and international applications of our 370-based configuration and we need a man or woman to join us as Project Leader.

A background in a financial environment and at least two years' relevant experience including some project responsibility is essential. Analytical ability and leadership are essential personal characteristics - and the ambition to realise the very substantial career potential of the job. Although London-based, there will be the opportunity for overseas assignments. Excellent remuneration package includes a salary of around £7K, mortgage subsidy and non-contributory pension scheme.

This appointment offers the chance to join a small team developing and running a sophisticated financial management system. Career potential is substantial within the UK area and the international organisation.

Please write to:

Grindlays Bank Limited

R. J. E. Barker, Appointments Manager,
Grindlays Bank Limited,
36 Fenchurch Street, London EC3.

**LONDON BOROUGH OF BARNET
Borough Treasurer's Department.****COMPUTER STAFF**

This is a large Authority currently operating an ICL 1803T under George 3 running a variety of batch and terminal work and a comprehensive on-line enquiry system. We are upgrading to an ICL 2800 in September. Training in ICL 2800 and VME/B will be provided. There are vacancies for:-

TECHNICAL SUPPORT TEAM LEADER

Grade PD12 - £8346 to £9887 p.a. inc. (ref. 246)

Responsible for control and motivation of a small team responsible for telecommunications and software usage and development.

This is a senior appointment and we are looking for a person with at least 7 years' computing experience in systems and programming who has played a major role in implementing an on-line system using ICL 1800 equipment and communications facilities.

The appointed person will play an important part in transferring and setting up the new computer and will be expected to take an active part in on-line systems currently being developed.

SYSTEMS PROGRAMMER

Grade S.01 - £8817 to £9883 p.a. inc. (ref. 261)

A computer professional with at least 5 years' programming/systems experience to work in a small team designing and supporting applications systems.

A computer related degree or the NCC Certificate in Systems Analysis would be an advantage.

SYSTEMS ANALYST

Grade API/16 - £3108 to £3368 p.a. inc. (ref. 268)

A person with at least 2 years' experience in programming/systems analysis to work in a small team designing and supporting applications systems.

A computer related degree or the NCC Certificate in Systems Analysis would be an advantage.

PROGRAMMER

Grade API/17 - £3108 to £3368 p.a. inc. (ref. 268)

Two years' experience in 1800 Cobol and/or Plan required to assist in developing and maintaining a wide range of applications including conversion to 2800.

COMPUTER OPERATOR

Grade C.5 - £888 to £1218 p.a. inc. (ref. 271)

Duties involve predominantly on-line under timesheet and data drive. Batch work being converted to run under OS in evening shift. The operations staff work two shifts - day 07.45 to 15.45 hours; evening 15.45 to 23.15 hours. Additional shift allowance payable.

Separation allowance payable up to six months, or longer in exceptional cases. 100% of removal expenses. Interest-free loans for the purchase of a house or a monthly season tickets. Additional leave at public bank holidays.

Application forms available from Room 46, Borough Treasurer's Department, Town Hall, Hendon, London, NW4 4BG. Telephone 01-202 8202 ext. 120, quoting reference number of post applied for. Closing date 4th August.

Informatix UK & O'seas Index**Phone 01-831 6055**

Informatix, 24 Gray's Inn Road London WC1X 8HR Telex 299539 HAVEN G



POSITION	SALARY	EMPLOYER	LOCATION	HARDWARE ENVIRONMENT	SOME OF THE QUALIFICATIONS	REF. NO.
Scientific/Technical Programmer	to £7,000+	Technical Consultancy	Various S. of England	Mini/Micros	Scientific/technical programmers with minimum 2 years' experience and preferably ALGOL, COBOL, FORTRAN, urgently required to work on a wide variety of projects. Excellent career prospects.	29/1
Standards Officers	c £6,500+	Insurance	Essex	IBM OS	Unusual senior post for a self-starter with programming and analysis experience in development and control standards covering all aspects of Data Processing including Operations.	29/2
Analyst/Programmer	£5,000+	Financial Services	London	Univac	Programmers with 2+ years' COBOL and preferably some FORTRAN needed for interesting development work using DB/Real Time/Batch processing.	29/3
Systems Analysts	to £10,000+ TAX FREE + ACCOM. + + +	Bureau	Saudi Arabia	IBM DOS	Systems analysts with commercial/financial experience required for development projects. 1 year+ renewable contract available. Interviews in London.	29/4
Analyst/Programmer	to £8,000	Manufacturer	Midx.	Mini	Excellent opportunities for programmers with 2 years+ commercial experience to work on a wide variety of projects in this successful organisation.	29/5
Systems Analysts	c £6,000 +	Engineering Industry	London	ICL 1900	Unusual opportunities for Analysts with 2 years+ experience to join a progressive organisation with challenging and unusual systems requirements.	29/6
Project Leaders	to £7,000	Chemical Industry	Midx.	IBM OS	Urgently required - DP professional with systems experience, a programming background and some supervisory experience to lead teams developing DB and TP applications.	29/7
Graphics/Communications Staff	c £8,000 quidars	Service Industry	Holland	Mini/Micros	People with engineering/graphics/CAD communications experience required for exciting development work based in Holland.	29/8
Programmers/Senior Programmer	to £7,250 +	Software House	London	Any	This rapidly expanding software house has vacancies for programmers with 3 years+ experience. COBOL essential. IBM background and 2nd language preferred.	29/9
Software/Systems Programmer	to £11,000 TAX FREE + ACCOM. + +	Construction Industry	Saudi Arabia	DOS/VS POWER	Systems programmer with 3 years+ experience urgently required to maintain and evolve software in this multi-site organisation. 1 year renewable contract.	29/10
Contract 1800 COBOL Programmers	£180 p.w. +	Software House	Canterbury	ICL 2800	Urgently required - ICL 1800 COBOL programmers to work on development projects on the new range machines.	29/11
Software Technicians	to £7,000 +	Electronic Engineering	Surrey	Any	Openings for professional staff with a bias towards engineering to work on advanced avionics systems in a company at the front of these advanced developments.	29/12
Programmers and Analysts	to £8,500 + benefits	Travel Industry	N. London	IBM	Opportunities for IBM COBOL/Assembler programmers and analysts with accounting experience to join this exciting travel organisation.	29/13
CAD/CAM Specialists & Analysts	At neg.	Equipment Manufacturer	Holland		Urgently required - CAD/CAM specialist with knowledge of numeric control to provide consultancy services to clients throughout Europe.	29/14
Programmers Junior and Senior	to £8,000 +	Electronics Industry	Surrey	Mini/Micros	Programmers urgently required with Assembler, Fortran, Algol, Cobol, or Coral experience to work on exciting scientific and technical applications.	29/15
Programmer/Analyst	to £8,000 +	Banking Services	City	PDP11	Excellent opportunities for programmers with sound programming experience to develop real time communications systems in a banking environment.	29/16
Senior Analyst/Project Manager	£12,000++ TAX FREE + ACCOM.	International Airlines	Middle East	IBM DOS VS POWER	Extensive experience of airline schedule planning. Previous experience of operational research is essential and a statistical background a distinct advantage.	29/17
Programmer/Consultant	to £9,000 +	Software House	Surrey	Various Mini/Micros	This rapidly expanding consultancy requires staff at all levels to work on advanced software/technical applications in the area of communications, real time, process control and basic software.	29/18
Analyst/Programmer and Software Programmer	to £8,500 + benefits + bonus + relocation exp.	Stockbroking	Keel	IBM DOS/VS	Programmers with PL/1, Assembler experience required to join this expanding organisation using CICS and SHADOW. Excellent opportunities for career progression.	29/19
Technical Writers/Instructors	c £7,000 + exp. allow. + +	Manufacturer	NW London	Mini	Unusual career opportunities for DP professionals with commercial experience to work in the educational/technical writing field for a major UK manufacturer.	29/20
Analyst/Programmer	to £7,000 +	Service Organisation	London	PDP11	Excellent career prospects for Analyst/Programmers with 2 years+ experience of BASIC+ and RSTS to work on a wide variety of applications.	29/21
DP/IT Programmers	to £8,000 +	Software House	Surrey and SE	Mini	Programmers with 2 years+ DP/IT required to work on a wide variety of commercial systems. System 3 background preferred. Excellent prospects for promotion.	29/22
Contract Staff	£180+ p.w.	Software House	London and South	Any	Programmers with COBOL, ALGOL, PL/1, PLAN, BASIC+ & OAP 16, or a wide variety of machines urgently required.	29/23



Great Opportunities in Data Communications

Sales Executives (NEW PRODUCTS)

Area Sales Engineer

Product Applications Engineer

RACAL

Communicate with Racal

Racal-Milgo Ltd, a member of the internationally famous Racal Electronics Group, is a world leader in the field of Data Communications.

The Company's outstanding success and current expansion of its product range, gives rise to the following vacancies.

Sales Executives

To join the new division marketing computer controlled voice response systems for data entry and file enquiry applications.

Applications are sought with proven sales ability and familiarity with data processing consultancy, bureaux or hardware/software. Positions will be based in either the Reading or Manchester offices.

Area Sales Engineer

To operate in the South East from the Reading headquarters of the highly successful UK Sales team, selling Data Communications equipment to computer-based users.

Applications (male or female) should write with details of age, qualifications and experience, to: D.J. Kitchenside, Personnel Officer, Racal-Milgo Limited, Prospect House, Thorn Street, Reading, Berks.

Preference will be given to applicants with direct selling experience in data processing, Communications or electronics.

All sales positions carry attractive base salaries plus generous commission and company cars.

Product Applications Engineer

To join the Engineering Group giving product support to the UK Sales Team.

Degree HNC qualifications are expected plus experience in design and development, using digital and analogue techniques. Direct experience in Data Communications and competence in software at assembler level would be an advantage.

A competitive salary commensurate with experience and ability will be paid.

The Company offers nearly five weeks annual leave and membership of a first class contributory pension scheme with free life assurance.

مسكنه من 11 شهر

TOP EUROPEAN COMPUTER MANUFACTURER

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LONDON, THE HOME COUNTIES, SOUTH AND SOUTH-WEST ENGLAND

Our Client, the major UK manufacturer of mainframe and mini computers, are looking to significantly expand their activities. The New Business Sector with offices in North, South and Central London, Southampton, Bristol and East Anglia is seeking to recruit additional high quality sales executives.

The New Business Sector handles amongst other equipment the most successful range of small to medium-sized computer systems ever designed and produced in Europe, winning awards for product design and export achievement. The organisation has invested large sums of money in providing education and training, preventive and remedial engineering as well as excellent software support and implementation services. We believe this to be vital for successful selling.

We have been retained to find:

SALES EXECUTIVES
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HIGH GUARANTEE (NON-RECOVERABLE)
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- Successful candidates should desirably have the following attributes:
- ★ At least 2 years' experience in selling of computer hardware, software or bureau services
 - ★ A desire to sell in a new business environment
 - ★ Ability to communicate with top level management
 - ★ Ambition and self-motivation

Not only does our Client offer an excellent basic package which could be as high as £15,000 (commission is payable over and above the guarantee), but there is also a professional management structure with a well designed career path. The normal benefits attributed to a major organisation are available together with a very generous car allowance.

Interested applicants should contact Roy Highfield and interviews will be arranged as soon as possible.

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Ref. CW 37/1

HAWKER
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PETTER REFRIGERATION LIMITED

The data processing department provides services to three Petter companies, all of which are active in the field of computer systems. Each of these companies has embarked on a computerisation programme, developed programme using communications equipment.

We now have vacancies for:

Chief Programmer

Responsible to the D.P. Manager for all programming activities on the site. Applicants should have in depth experience of I.C.L. utilities, systems programming, modular programming, structured design techniques and of 1900/2904 hardware.

Senior Programmer

Responsible to the Chief Programmer, with similar experience of the equipment and techniques detailed above.

Analyst/Programmer

To join our operations support team which entails user contact and responsibility for the enhancement of a wide range of applications systems.

Programming in Cobol but some knowledge of Plan and/or RPG2 would be advantageous, especially for the Analyst/Programmer position.

The department runs a 2904 with tapes, large and small discs and communications equipment. Further hardware is on order.

Attractive salary and conditions of employment will be offered and will include pension and life insurance schemes.

Applicants, both male and female, should apply to: The Recruitment Manager, Petter Refrigeration Limited, Hamble, Southampton SO3 5NJ. Tel: Hamble (042 122) 2061, Ext. 337.

PETTERS



Have you considered changing to Sales?

WE NEED experienced systems or O & M personnel to train as sales executives to manage UK territories in the North and South West — and we are prepared to pay for the right people.

WE'RE IN the source data capture business and manufacture the leading European optical mark reader, the OATATERM 3, together with a tag reader, the DATATAG 4, and the recently announced hand portable, microprocessor data collection unit, the DATAPORT 5.

THE JOB is for energetic people with disciplined minds, who are capable of meeting the challenge of selling systems.

WE'RE NOT RIGID about age and qualifications, but the preferred range is 25-35, and applications from experienced computer industry salesmen are welcomed.

IF THE JOB appeals to you, please telephone our Commercial Manager, Michael Hunt, on Reading 598511 or write to him.

DATA RECOGNITION LIMITED
 Lovelock Road, Reading, Berkshire RG3 1DX

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 Notice Required / Data Available (date) _____
 Areas Preferred: First Choice _____ Second Choice _____
 Experience to date: (Last Position First) _____
 Company: Name _____ From _____ To _____
 and Location _____ Mth/Year _____ Mth/Year _____
 Hardware _____ Operating Systems/Software _____

Date

Signature



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NATIONAL HOUSE, 66 WARDOUR STREET
 LONDON W1V 3HP. 01-439 6481 (24 hours)

REG. NO.
 DATE
 01/20/17/78

THE SALES BIT

Prospecting (2)—the first telephone call

THE telephone is a key device within the "pioneering" process. In most circumstances it is the salesman's essential link between "desk evaluation" and the first face-to-face contact with the potential client. In fact, the first telephone call to a prospect is, with the exception of the final close, the most important contact of all. If you get it wrong, you don't even get into the action, which, from a negative standpoint, is marginally preferable to getting into the action and losing the business.

What must be avoided at all costs is selling the product over the telephone!

It is so easy to get drawn into a sales presentation over the telephone when the prospect's response takes the form of a question. What is it? How much? Why should I? etc. The salesman has to be prepared for this and make it clear that the real benefits of his product can only be assessed once he has a real understanding of the prospect's business, and that is the reason for the suggested meeting.

If the salesman is selling a process control system, for instance, and addressing himself to the chemical industry, then his approach, which might also involve an initial letter, might be as follows:

Good morning Mr Prospect. My name is Fred, salesman from the Electronic Computer Company. Our process control system is bringing about considerable savings for a large number of chemical companies in both batch and continuous-flow production. I would like to meet you to discuss the ways in which we could provide similar benefits to your company. Would you prefer to see me next week or the week after?

It's always a good idea to end with an "assumptive optional close" so that the prospect is perhaps persuaded to decide when he should see the salesman, not if he should see him.

A device which has served me well in the past is to agree a "finishing time" as well as a "start time" to the proposed meeting. Suggest 45 minutes or whatever minimum is appropriate. This way the prospect will know what kind of time commitment he is agreeing to end will consequently be more relaxed and more inclined to say yes.

There are three other points to bear in mind. Firstly, the level of initial contact is often the highest point in the company hierarchy that the salesman will achieve, so he must make sure it is at the decision level, and that normally means the managing director.

Second consideration is whether the salesman can overcome the "protective secretary".

Thirdly, start with a KISS. Keep It Simple, Stupid. Otherwise, it could be the "Kiss of Death" for new account sales.

Having decided that a company apparently has the potential of becoming a source of profitable business, then the telephone call itself needs to have a specific objective, and a pre-defined structure. The objective, as already stated, is to get an appointment, while the structure is merely the route to that objective and should consist of three elements:

1. State who you are and where you are from.

2. Give reasons why it could be to the prospect's advantage to see you.

3. Agree a time and place to meet.

Most salesmen seem to find it easier to handle the situation by prefacing the telephone call with a letter covering items one and two.

In my experience, this approach depends on the type of company and industry involved, but more often than not it is advantageous.

Now since the first four figures are mixed odd and even, the divisor must be odd if the remainder is constant.

The only factors of 46 are 2 and 23, so 23 is the required divisor giving a constant remainder of 4.

TRADER

Puzzle answer

 **Castle Computer Services Limited**
271 High Street, Beckenstead, Harris. 18W Phone: (04427) 73151

Administration Department
SINGAPORE AIRLINES LIMITED
580-586 Chiswick High Road
London W4
Tel: 01-895 4901

for an appointment. Applicants should bring their letters of application and relevant documents to the interview

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Computer Services Limited

Cleo led Hex quickly past rows of dours, each Idanlica save for a machine-readable bar-coded nameplate. Eventually she knocked on one. A few moments later it was



resistance movement."

It was James Hock, sitting on his bike again, with a law enforcement robot on either side.
Will Hex get zapped? Has Zep been Hexed? No prizes for guessing the answers.

LONDON (01) 637 0781 MANCHESTER (061) 632 5856 BIRMINGHAM (021) 643 189
BRISTOL (0272) 211035 EDINBURGH (031) 226 6381 CRAWLEY (0293) 514051

PRODUCT NEW

Expanding CS/40 disc capacity

THE maximum disc storage capacity of Data General's CS/10 business computers has been increased nearly 20 times with the introduction of 96 and 190 Megabyte disc drives.

Data General quotes \$26,250 for a CS/40 model C with one 88 Megabyte disc store, four video terminals, a magnetic tape drive and a 300 lpm printer. A C8 system with two 180 Megabyte disc stores, two displays, a magnetic tape drive, one 60 cps printer and a 300 lpm printer costs \$28,790. The main software feature of the CS/40 is interactive Cobol.

Date General 741 (CW)
Westway House, 320 Ruislip
Road East, Granford, U06
9BH. Tel: 01-578 9231.



Portable tester for PC boards

FROM GenRad is a portable service tester for field service diagnosis of printed circuit board faults. Named GR 2225, the maker claimed that its use would reduce stocks of spare boards as the repair "pipeline" would be restored.

Based on a tailor-made 10-bit chip that is similar in power and architecture to the LSI-11, the GR 2225 has 192 fully programmable driver sensors that are expandable, guide-probe diagnostics, six user power supplies, magnetic tape program storage, a paper strip printer, keyboard, alphanumeric display and a built-in digital multimeter.

An RS 232 interface allows download of testing programs translated from programs prepared for printed circuit board test systems made by GenRad, Taradyn, Computer Automation, Micro and Instrumentation Engineering.

In addition, a built-in acoustic coupler and modem enables test programs to be sent over standard telephone lines at rates up to 9,600 baud asynchronous and 56K baud synchronous.

**GenRad Ltd (CW), Bourne
Eed, Buckinghamshire. Tel:
06285 26611.**

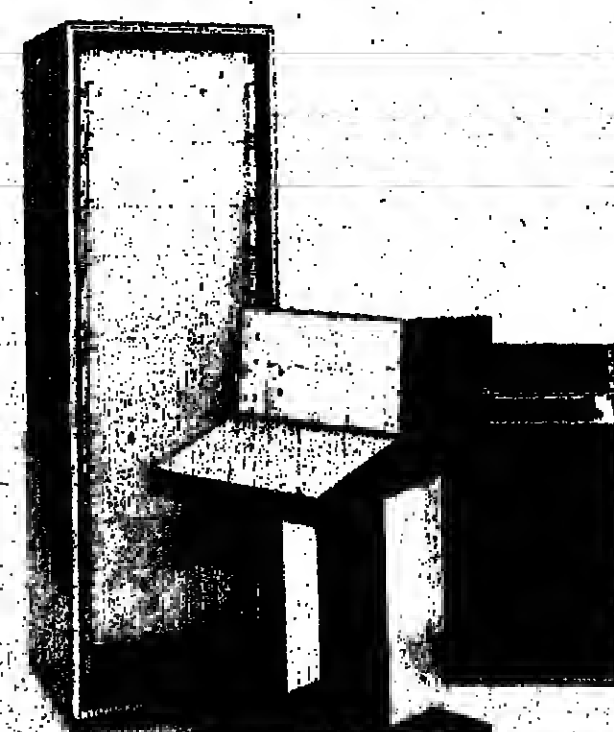
Aid to diagnosing faulty comms lines

PROBLEMS on communication lines can be diagnosed using the DLM II portable data line monitor from Cole Electronics. This is now available with a high capacity data recording unit called Tapetrap which enables the DLM II to operate undisturbed.

Tapetrap can be programmed to automatically stop recording transmitted data when a certain sequence of characters is detected. The sequence can have up to 16 characters and can be a polling sequence, a special message or an error routine.

A 1,280-character VDU can be supplied with the system to examine data that may indicate the nature of a com-

Tapetrap can handle a four-track magnetic tape cartridge that can store one million data and control characters. This is equivalent to a full hour of data communications traffic at 2,400 bits per second.



Add-on memory

USERS of Digital Equipment PDP-11/04 and 11/34 computers are now offered an add-in memory by Intel that comes with spare pre-leads

Called the M-5034, the mandry can be supplied with

Standalone comms interfaces

USERS of Remex paper tape peripherals are now offered a range of stand-alone communication interfaces for them by the manufacturer of Remex equipment, Sintrom Filinor. Three interface models are available.

Two are single-port interfaces. These are the Ramex RJR 2321 for paper tape readers and the RJJ 2321 for combination reader-perforators. Both connect to a modem or directly to the host computer and come with a programmable read-only memory for decoding Ascii

The RJA 2322 is a dual-port model for reader/perforators. It comes with a modem port and a separate interface for connecting the reader/perforator to a display terminal, a teletypewriter or a printer.

Sintrom Ellnor Ltd (CW)
Arkwright Road, Reading
RG2 0LS. Tel: 0734 85444.

Fibre optics assembly kit

FIBRE optic data links can be assembled using the Fibre Link Engineers Kit from Lee Green Precision Industries Ltd.

The supplier said that the kit enables engineers to rapidly construct simple and complex fibre optic data links with no previous experience.

Fibre-Link Division, Le Grant Precision Industries Ltd (CW), Groves Floor, Blackheath, London SE3 0RA. Tel: 01-862 2293.